

Guide for
FEDERAL SPECIFICATIONS

WWP-401

INCLUDING:

**Cast Iron Soil Pipe
and Fittings**

EXTRA-HEAVY AND SERVICE-WEIGHT

THIS BOOKLET is intended to simplify drafting problems in laying out cast iron soil, water, and vent systems. It contains all standard dimensions and tables found in Federal Specification WWP-401 covering Extra-Heavy Cast Iron Soil Pipe and Fittings, plus new tables for Service-weight Pipe and Fittings found in Amendment 2. A great deal of explanatory material scattered throughout the Federal specifications has been condensed and simplified under "HOW TO USE THIS BOOKLET IN THE DRAFTING ROOM." (See next page.)

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HOW TO USE THIS BOOKLET IN THE DRAFTING ROOM

This booklet reproduces sections of the current Federal Specifications WWP-401 and Amendment 3, covering dimensions of

- 1. Extra-heavy Cast Iron Soil Pipe and Fittings (hereafter designated as Class A)**
- 2. Service-weight Cast Iron Soil Pipe and Fittings (hereafter designated as Class B)**

Only Class A is illustrated, because essential roughing-in dimensions for Classes A and B are the same. Slight differences occur in wall thicknesses and hub and spigot dimensions—which are unimportant at the scales customarily used for piping plans and details. These differences are shown in Tables IIa and IIb.

The weights given for fittings apply to Class A only. As yet there are no Federal Specifications for the weights of Class B fittings.

Class B spigots will fit Class A hubs; Class A spigots, however, will not caulk properly in Class B hubs.

CAST IRON SOIL PIPE AND FITTINGS

Weights and Dimensions

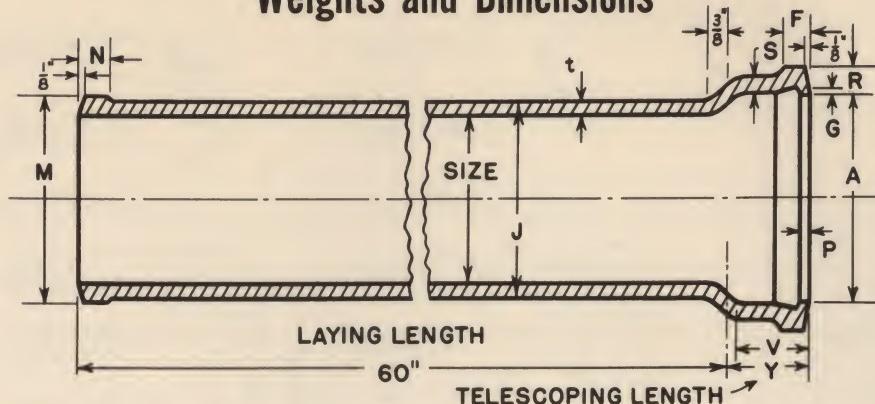


FIGURE I.—Dimensions of cast iron soil pipe. (Hub and spigot dimensions apply also to fittings.)

TABLE IIa.—Dimensions of hubs and spigots for Extra-heavy, class A, cast iron soil pipe and fittings, in inches

Size (1)	Inside diameter of hub	Outside diameter of spigot	Outside diameter of barrel	Thickness of barrel (min.)	Thickness of hub		Width of hub bead	Width of spigot bead	Depth of lead groove (2) (max.)	Depth of hub	Telescoping length	Distance from groove to end, P				
					Hub body (min.)	Over bead (min.)										
					A	M	J	T	S	R	F	N	G	V	Y	Minimum, pipe and fittings
															Pipe	Fittings
2.....	3.06	2.75	2.38	0.12	0.18	0.37	0.63	0.56	0.13	2.28	2.50	0.25	0.38	0.31		
3.....	4.19	3.88	3.50	.18	.25	.43	.69	.63	.13	2.56	2.75	.25	.38	.31		
4.....	5.19	4.88	4.50	.18	.25	.43	.75	.69	.13	2.81	3.00	.25	.38	.31		
5.....	6.19	5.88	5.50	.18	.25	.43	.75	.69	.13	2.81	3.00	.25	.38	.31		
6.....	7.19	6.88	6.50	.18	.25	.43	.75	.69	.13	2.81	3.00	.25	.38	.31		
8.....	9.50	9.00	8.63	.25	.34	.59	1.06	1.00	.19	3.38	3.50	.31	.50	.44		
10.....	11.63	11.13	10.75	.31	.40	.65	1.06	1.00	.19	3.31	3.50	.31	.50	.44		
12.....	13.75	13.13	12.75	.31	.40	.65	1.31	1.25	.19	4.13	4.25	.38	.63	.56		
15.....	17.00	16.25	15.88	.37	.46	.71	1.31	1.25	.25	4.06	4.25	.38	.63	.56		

NOTE 1.—Nominal inside diameter.

NOTE 2.—The shape of the groove is optional.

TABLE IIb.—Dimensions of hubs and spigots for Service-weight, class B, cast iron soil pipe and fittings

Size (1)	Inside diameter of hub	Outside diameter of spigot	Outside diameter of barrel	Thickness of barrel, minimum	Thickness of hub		Width of hub bead	Width of spigot bead	Depth of lead groove (2), maximum	Telescoping length	Distance from groove to end, pipe and fittings					
					Hub body, minimum	Over bead, minimum										
					A	M	J	t	s	R	F	N	G	V	Y	Minimum
Inches	Inches	Inches	Inches	Inch	Inch	Inch	Inches	Inch	Inches	Inch	Inches	Inch	Inch	Inch	Inch	Inch
2.....	2.94	2.62	2.25	0.10	0.13	0.34	0.75	0.69	0.12	2.44	0.25	0.38				
3.....	3.94	3.62	3.25	.12	.16	.37	.81	.75	.12	2.68	.25	.38				
4.....	4.94	4.62	4.25	.12	.16	.37	.88	.81	.12	2.94	.25	.38				
5.....	5.94	5.62	5.25	.12	.16	.37	.88	.81	.12	2.94	.25	.38				
6.....	6.94	6.62	6.25	.12	.18	.37	.88	.81	.12	2.94	.25	.38				
8.....	9.25	8.75	8.38	.17	.19	.44	1.19	1.12	.12	3.50	.25	.38				
10.....	11.38	10.88	10.50	.21	.27	.53	1.19	1.12	.12	3.50	.31	.50				
12.....	13.50	12.88	12.50	.22	.27	.53	1.44	1.38	.12	4.25	.38	.62				
15.....	16.75	16.00	15.62	.25	.30	.58	1.44	1.38	.12	4.25	.38	.62				

NOTE 1.—Nominal inside diameter.

NOTE 2.—Minimum depth of lead groove, 0.09 inch. Shape is optional.

TABLE III.—Weights of Extra-heavy, class A cast iron soil pipe, pounds

Pattern	Sizes (in inches)									
	2	3	4	5	6	8	10	12	15	
Class A, single hub..	25	45	60	75	95	150	215	270	375	
Class A, double hub..	26	47	63	78	100	157	225	285	395	

Weights of Service-weight, class B cast iron soil pipe, pounds

Pattern	Sizes (in inches)									
	2	3	4	5	6	8	10	12	15	
Class B, single hub..	20	30	40	52	65	100	145	190	255	
Class B, double hub..	21	31	42	54	68	105	150	200	270	

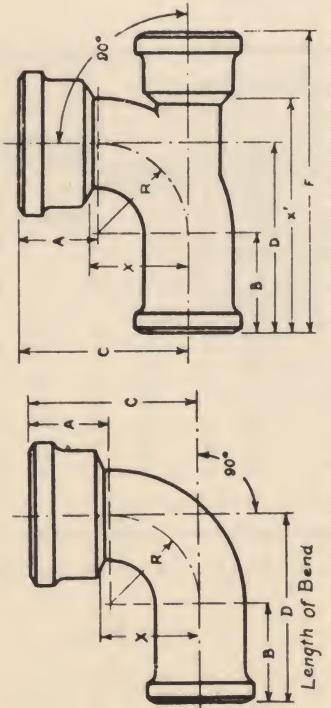


FIGURE 2.— $\frac{1}{4}$ bend (fig. 2)

Size (inches)	Dimensions in inches ¹						Weight (pounds)
	A	B	C	D	R	X	
2	2 $\frac{1}{4}$	3	5 $\frac{1}{4}$	6	3	3 $\frac{1}{4}$	5
3	3 $\frac{1}{4}$	4	6 $\frac{1}{4}$	7 $\frac{1}{2}$	4	4 $\frac{1}{2}$	10
4	3 $\frac{1}{4}$	4	7 $\frac{1}{2}$	8	4 $\frac{1}{2}$	15	16
5	3 $\frac{1}{4}$	4	8 $\frac{1}{4}$	9	5	5 $\frac{1}{4}$	18
6	3 $\frac{1}{4}$	4	10 $\frac{1}{4}$	11 $\frac{1}{4}$	6	6 $\frac{1}{4}$	23
8	4 $\frac{1}{2}$	5 $\frac{1}{4}$	11 $\frac{1}{4}$	12 $\frac{1}{4}$	7	7 $\frac{1}{4}$	29
10	4 $\frac{1}{2}$	5 $\frac{1}{4}$	13 $\frac{1}{4}$	15	8	8 $\frac{1}{4}$	57
12	5	7	13 $\frac{1}{4}$	17	10	10 $\frac{1}{4}$	88
15	5	7	14 $\frac{1}{4}$	15 $\frac{1}{4}$	12	12 $\frac{1}{4}$	123

¹ For details of hubs and spigots, see table II.
Weights for $\frac{1}{4}$ bends in lengths up to 36 inches are given in table XLI.

Note.—Dimensions D and X are laying lengths.

TABLE V.— $\frac{1}{4}$ bend with heel inlet (fig. 3)

Size (inches)	Dimensions in inches ¹						Weight (pounds)
	A	B	C	D	F	R	
3 by 2	3 $\frac{1}{4}$	3 $\frac{1}{4}$	6 $\frac{1}{4}$	7	11 $\frac{1}{4}$	3 $\frac{1}{4}$	9
4 by 2	3 $\frac{1}{4}$	4	7 $\frac{1}{2}$	8	13	4	10 $\frac{1}{4}$
4 by 3	3 $\frac{1}{4}$	4	7 $\frac{1}{2}$	8	13 $\frac{1}{4}$	4	10 $\frac{1}{4}$
5 by 2	3 $\frac{1}{4}$	4	8 $\frac{1}{4}$	8 $\frac{1}{4}$	14 $\frac{1}{4}$	5	11 $\frac{1}{4}$
5 by 3	3 $\frac{1}{4}$	4	8 $\frac{1}{4}$	8	14 $\frac{1}{4}$	5	12 $\frac{1}{4}$
5 by 4	3 $\frac{1}{4}$	4	8 $\frac{1}{4}$	8	14 $\frac{1}{4}$	5	13 $\frac{1}{4}$
6 by 2	3 $\frac{1}{4}$	4	8 $\frac{1}{4}$	9	15	6	14 $\frac{1}{4}$
6 by 3	3 $\frac{1}{4}$	4	8 $\frac{1}{4}$	9	15 $\frac{1}{4}$	6	15 $\frac{1}{4}$
6 by 4	3 $\frac{1}{4}$	4	8 $\frac{1}{4}$	9	15 $\frac{1}{4}$	6	16 $\frac{1}{4}$

¹ For details of hubs and spigots, see table II.
Weights for $\frac{1}{4}$ bends in lengths up to 36 inches are given in table XLI.

Note.—Dimensions D, X, and X' are laying lengths.

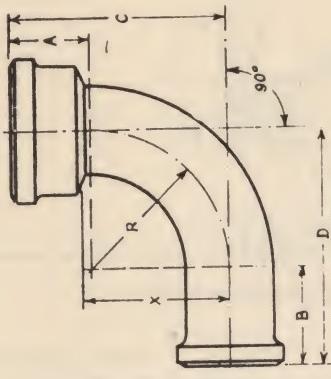


FIGURE 3.— $\frac{1}{4}$ bend with heel inlet.

TABLE IV.— $\frac{1}{4}$ bend (fig. 2)

Size (inches)	Dimensions in inches ¹						Weight (pounds)
	A	B	C	D	R	X	
2	2 $\frac{1}{4}$	3	5 $\frac{1}{4}$	6	3	3 $\frac{1}{4}$	5
3	3 $\frac{1}{4}$	4	6 $\frac{1}{4}$	7 $\frac{1}{2}$	4	4 $\frac{1}{2}$	10
4	3 $\frac{1}{4}$	4	7 $\frac{1}{2}$	8	4 $\frac{1}{2}$	15	16
5	3 $\frac{1}{4}$	4	8 $\frac{1}{4}$	9	5	5 $\frac{1}{4}$	23
6	3 $\frac{1}{4}$	4	10 $\frac{1}{4}$	11 $\frac{1}{4}$	6	6 $\frac{1}{4}$	29
8	4 $\frac{1}{2}$	5 $\frac{1}{4}$	11 $\frac{1}{4}$	12 $\frac{1}{4}$	7	7 $\frac{1}{4}$	57
10	4 $\frac{1}{2}$	5 $\frac{1}{4}$	13 $\frac{1}{4}$	15	8	8 $\frac{1}{4}$	88
12	5	7	13 $\frac{1}{4}$	17	10	10 $\frac{1}{4}$	123
15	5	7	14 $\frac{1}{4}$	15 $\frac{1}{4}$	12	12 $\frac{1}{4}$	167

¹ For details of hubs and spigots, see table II.

Note.—Dimensions D and X are laying lengths.

TABLE VI.—Short and long sweeps (fig. 4)

Size (inches)	Dimensions in inches ¹						Weight (pounds)
	A	B	C	D	R	X	
2	2 $\frac{1}{4}$	3	3 $\frac{1}{4}$	3	3 $\frac{1}{4}$	3	5
3	3 $\frac{1}{4}$	4	4 $\frac{1}{2}$	4	4 $\frac{1}{2}$	4	6
4	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	5	5 $\frac{1}{4}$	4	13
5	3 $\frac{1}{4}$	4	6 $\frac{1}{4}$	6	6 $\frac{1}{4}$	4	23
6	3 $\frac{1}{4}$	4	7 $\frac{1}{2}$	7 $\frac{1}{2}$	5	5 $\frac{1}{4}$	34
8	4 $\frac{1}{2}$	5 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	7	7 $\frac{1}{4}$	67
10	4 $\frac{1}{2}$	5 $\frac{1}{4}$	10 $\frac{1}{4}$	10 $\frac{1}{4}$	8	8 $\frac{1}{4}$	103
12	5	7	12 $\frac{1}{4}$	12 $\frac{1}{4}$	10	10 $\frac{1}{4}$	134
15	5	7	15 $\frac{1}{4}$	15 $\frac{1}{4}$	12	12 $\frac{1}{4}$	212

¹ For details of hubs and spigots, see table II.

Note.—Dimensions D and X are laying lengths.

TABLE VII.—Long sweep (fig. 4)

Size (inches)	Dimensions in inches ¹						Weight (pounds)
	A	B	C	D	R	X	
2	2 $\frac{1}{4}$	3	3 $\frac{1}{4}$	3	3 $\frac{1}{4}$	3	8
3	3 $\frac{1}{4}$	4	4 $\frac{1}{2}$	4	4 $\frac{1}{2}$	4	9
4	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	5	5 $\frac{1}{4}$	4	10
5	3 $\frac{1}{4}$	4	6 $\frac{1}{4}$	6	6 $\frac{1}{4}$	4	13
6	3 $\frac{1}{4}$	4	7 $\frac{1}{2}$	7 $\frac{1}{2}$	5	5 $\frac{1}{4}$	23
8	4 $\frac{1}{2}$	5 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	7	7 $\frac{1}{4}$	34
10	4 $\frac{1}{2}$	5 $\frac{1}{4}$	10 $\frac{1}{4}$	10 $\frac{1}{4}$	9	9 $\frac{1}{4}$	67
12	5	7	12 $\frac{1}{4}$	12 $\frac{1}{4}$	11	11 $\frac{1}{4}$	103
15	5	7	15 $\frac{1}{4}$	15 $\frac{1}{4}$	13	13 $\frac{1}{4}$	141

¹ For details of hubs and spigots, see table II.

Note.—Dimensions D and X are laying lengths.

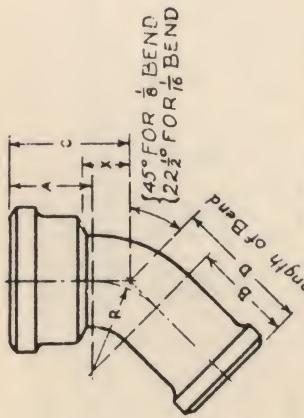


FIGURE 5.— $\frac{1}{8}$ bend and $\frac{1}{8}$ bend.

TABLE VIII.— $\frac{1}{8}$ bend (fig. 5)

Size (inches)	Dimensions in inches:					Weight (pounds)
	A	B	C	D	R	
2	2 1/4	4	4 1/4	3	1 1/4	4
3	3 1/4	3 1/4	4 1/4	3 1/4	1 1/4	8
4	4	5 1/4	5 1/4	4	2 3/4	12
5	5 1/4	4	5 1/4	3 1/4	2 3/4	15
6	6	5 1/4	5 1/4	4 1/4	2 1/2	18
8	8	6 1/4	6 1/4	3 1/4	4 1/4	41
10	10	6 1/4	6 1/4	3 1/4	6 1/4	61
12	12	6 1/4	7	8 3/4	7	87
14	14	7	8 3/4	8	4 1/4	129
16	16	7	8 3/4	10 1/4	9 1/4	94

¹ For details of hubs and spigots, see table II.

² Weights for $\frac{1}{8}$ bends in lengths up to 36 inches are given in table XLI.

NOTE. Dimensions D and X are laying lengths.

TABLE IX.— $\frac{1}{8}$ bend (fig. 5)

Size (inches)	Dimensions in inches:					Weight (pounds)
	A	B	C	D	R	
2	2 1/4	3	3 1/4	3 1/4	3	74
3	3 1/4	3 1/4	3 1/4	3 1/4	3 1/4	4
4	4	4 1/4	4 1/4	4 1/4	4 1/4	8
5	5	4 1/4	4 1/4	4 1/4	4 1/4	11
6	6	4 1/4	4 1/4	4 1/4	4 1/4	13
8	8	5 1/4	5 1/4	4 1/4	4 1/4	16
10	10	5 1/4	5 1/4	4 1/4	4 1/4	20
12	12	5 1/4	5 1/4	4 1/4	4 1/4	25
14	14	5 1/4	5 1/4	4 1/4	4 1/4	30
16	16	5 1/4	5 1/4	4 1/4	4 1/4	36

¹ For details of hubs and spigots, see table II.

NOTE. Dimensions D and X are laying lengths.

² For details of side inlets, see table II.

³ Weights for Y branches in lengths up to 36 inches are given in table XII.

See next page for continuation of this table.



FIGURE 6.—Y branches, single, double, and with cleanout. (fig. 6)

TABLE X.—Y branches, single and double (fig. 6)

Size (inches)	Dimensions in inches:					Weight, single (pounds)	Weight, double (pounds)
	B (min)	E	E'	F	G		
2	3 1/4	6 1/4	6 1/4	6 1/4	10 1/4	8	4
3	4	8 1/4	8 1/4	8 1/4	12	10 1/4	11
4	5	9 1/4	9 1/4	9 1/4	13 1/4	12 1/4	24
5	6	10 1/4	10 1/4	10 1/4	15 1/4	13 1/4	32
6	7	11 1/4	11 1/4	11 1/4	18	13 1/4	41
8	8	12 1/4	12 1/4	12 1/4	23	15 1/4	61
10	10	13 1/4	13 1/4	13 1/4	26	18 1/4	107
12	12	14 1/4	14 1/4	14 1/4	30	22 1/4	168
14	14	15 1/4	15 1/4	15 1/4	36	27 1/4	236
16	16	16 1/4	16 1/4	16 1/4	40	31 1/4	308
18	18	17 1/4	17 1/4	17 1/4	44	35 1/4	348
20	20	18 1/4	18 1/4	18 1/4	48	39 1/4	388
22	22	19 1/4	19 1/4	19 1/4	52	43 1/4	428
24	24	20 1/4	20 1/4	20 1/4	56	47 1/4	468
26	26	21 1/4	21 1/4	21 1/4	60	51 1/4	518
28	28	22 1/4	22 1/4	22 1/4	64	55 1/4	558
30	30	23 1/4	23 1/4	23 1/4	68	59 1/4	598
32	32	24 1/4	24 1/4	24 1/4	72	63 1/4	638
34	34	25 1/4	25 1/4	25 1/4	76	67 1/4	678
36	36	26 1/4	26 1/4	26 1/4	80	71 1/4	718

¹ For details of hubs and spigots, see table II.

² For details of side inlets, see table II.

³ Weights for Y branches in lengths up to 36 inches are given in table XII.

See next page for continuation of this table.

TABLE X.—Y branches, single and double (fig. 6)—Continued

Size (inches)	Dimensions in inches ¹						Weight, double (pounds) ²	
	B (mm)	E	E'	F	G	X	X'	
12 by 6	7	16 ⁹ / ₁₆	16 ⁷ / ₁₆	22 ¹ / ₂	5 ¹ / ₂	18	13 ⁷ / ₁₆	122
12 by 8	7	18 ¹ / ₁₆	18 ¹ / ₁₆	25 ¹ / ₂	7 ¹ / ₂	21	14 ³ / ₈	161
12 by 10	7	19 ¹ / ₁₆	19 ¹ / ₁₆	28 ¹ / ₂	8 ⁹ / ₁₆	24	15 ¹ / ₂	195
15 by 6	7	18 ¹ / ₄	18 ¹ / ₄	22 ¹ / ₂	4	18	15 ³ / ₄	163
15 by 8	7	19 ¹ / ₄	19 ¹ / ₄	25 ¹ / ₂	5 ³ / ₈	21	17 ¹ / ₂	182
15 by 10	7	21 ³ / ₁₆	20 ⁹ / ₁₆	28 ¹ / ₂	6 ⁵ / ₈	24	18 ⁵ / ₈	207
15 by 12	7	22 ¹ / ₁₆	21 ³ / ₁₆	21 ³ / ₂	6 ³ / ₈	27	19 ¹ / ₂	248
								292

¹ For details of hubs and spigots, see table II. For details of side inlets, see fig. 28.

² Weights for Y branches in lengths up to 36 inches are given in table XL.

Note.—Dimensions X and X' are laying lengths.

TABLE XI.—Y branch cleanout with screw plug on main (fig. 6, view A)

Size (inches)	Dimensions in inches ¹						I. P. S. tapping ²	Weight without plug (pounds)
	E	E'	F	G	X	X'		
2	5 ¹ / ₂	6 ¹ / ₂	9 ¹ / ₂	4	4	1 ¹ / ₂	1 ¹ / ₂	9
3	6 ³ / ₈	8 ¹ / ₂	11 ⁵ / ₈	5 ¹ / ₂	5 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂	16
4	7 ¹ / ₈	9 ¹ / ₂	13 ¹ / ₂	6 ³ / ₈	6 ³ / ₈	3 ¹ / ₂	3 ¹ / ₂	21
5	9 ¹ / ₈	11	14 ¹ / ₂	5 ³ / ₈	5 ³ / ₈	4 ¹ / ₂	4 ¹ / ₂	28
6	10 ¹ / ₈	12 ¹ / ₂	16 ¹ / ₂	6 ⁵ / ₈	6 ⁵ / ₈	5 ¹ / ₂	5 ¹ / ₂	37

¹ For dimensions of hubs and spigots, see table II. For details of tapping boss, see table XL; and for screw plugs, see table XXXVII.

² Tappings permit entrance of testing plugs.

Note.—Dimension X' is the laying length.

TABLE XII.—Y branch cleanout with screw plug on branch (fig. 6, view B)

Size (inches)	Dimensions in inches ¹						I. P. S. tapping ²	Weight without plug (pounds)
	E	E'	F	G	X	X'		
2	6 ¹ / ₂	5 ¹ / ₂	10 ¹ / ₂	4	8	1 ¹ / ₂	1 ¹ / ₂	9
3	8 ¹ / ₂	6 ¹ / ₂	13 ¹ / ₂	5 ¹ / ₂	10 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂	15
4	9 ¹ / ₂	7 ¹ / ₂	15	5 ¹ / ₂	12	3 ¹ / ₂	3 ¹ / ₂	21
5	11	9 ¹ / ₂	16 ¹ / ₂	5 ³ / ₈	13 ¹ / ₂	4 ¹ / ₂	4 ¹ / ₂	28
6	12 ¹ / ₂	10 ¹ / ₂	18	5 ³ / ₈	15	5 ¹ / ₂	5 ¹ / ₂	37

¹ For dimensions of hubs and spigots, see table II.

² For details of tapping boss, see table XL; and for screw plugs, see table XXXVIII. Tappings permit entrance of testing plugs.

Note.—Dimension X is the laying length.

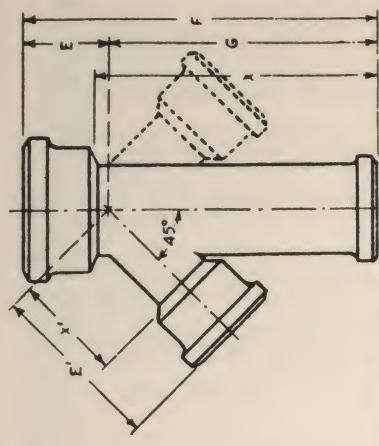


Figure 7.—Y branch, inverted, single and double (fig. 7)

TABLE XIII.—Y branches, inverted, single and double (fig. 7)

Size (inches)	Dimension in inches ¹						Weight single (pounds)	Weight double (pounds)
	E	E'	F	G	X	X'		
2	3 ¹ / ₂	4	7 ³ / ₈	12 ¹ / ₂	8 ³ / ₄	9 ¹ / ₄	3 ¹ / ₂	12
3	4	4 ¹ / ₂	8 ³ / ₈	17 ¹ / ₂	12 ¹ / ₂	14	4 ³ / ₄	22
4	4 ¹ / ₂	4 ¹ / ₂	10 ¹ / ₂	17 ¹ / ₂	17	15 ¹ / ₂	5 ¹ / ₂	32
5	5 ¹ / ₂	5 ¹ / ₂	10 ¹ / ₂	18 ¹ / ₂	17 ¹ / ₂	17	7 ¹ / ₂	42
6	5 ¹ / ₂	5 ¹ / ₂	11 ³ / ₈	20 ¹ / ₂	15	17	9	51
7	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
8	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
9	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
10	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
11	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
12	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
13	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
14	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
15	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
16	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
17	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
18	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
19	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
20	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
21	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
22	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
23	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
24	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
25	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
26	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
27	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
28	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
29	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
30	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
31	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
32	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
33	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
34	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
35	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
36	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
37	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
38	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
39	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
40	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
41	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
42	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
43	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
44	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
45	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
46	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
47	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
48	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
49	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
50	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
51	5 ¹ / ₂	5 ¹ / ₂	13 ¹ / ₂	20 ¹ / ₂	15	17	15 ¹ / ₂	61
52	5 ¹ / ₂	5 ¹ / ₂	13 ¹ /					

TABLE XV.—Combination Y and Y bend cleanout with screw plug on main₁ (fig. 8, view A)

Size (inches)	Dimensions in inches:		Weight without plug (pounds)	Size (inches)	Dimensions in inches:		I. P. S. tapping	Weight without plug (pounds)
	E	F			E	F		
2	5 1/4	9 1/4	1 1/2	9	9 1/4	14 1/2	4 1/2	34
3	6 3/4	6 1/4	2 1/2	17	10 1/4	16 1/4	5 1/2	47
4	7 7/8	13 3/8	3 1/2	26				

For dimensions not given in this table, see table XIV.

For details of tapping boss, see table X-L; and for screw plugs, see table XXVII.



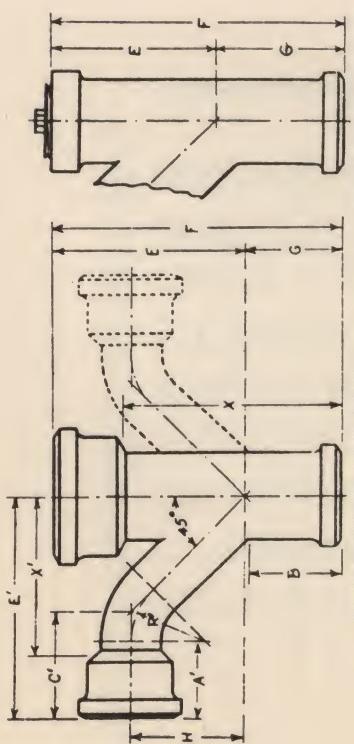
FIGURE 8.—Combination Y and Y bend.

TABLE XIV.—Combination Y and Y bend, single and double (fig. 8)

Size (inches)	Dimensions in inches!										Weight, single (pounds)	Weight, double (pounds)	
	A'	B	C	E	E'	F	G	H	R'	X	N'		
2	234	316	4	634	634	736	1024	336	3	8	474	10	15
3	314	4	413	814	934	1345	1545	516	314	1014	474	20	29
4	312	4	581	934	12	1554	1654	634	4	12	9	29	43
5	312	4	581	11	1234	1574	1853	834	4	12	9	38	56
6	312	4	581	11	1234	1574	1853	834	4	12	9	50	70
7	312	4	581	11	1234	1574	1853	834	4	12	9	50	70
8	312	4	443	794	834	1134	1334	436	3	9	534	15	20
9	312	4	443	834	8934	1134	1334	436	3	9	614	18	23
10	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
11	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
12	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
13	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
14	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
15	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
16	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
17	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
18	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
19	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
20	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
21	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
22	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
23	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
24	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
25	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
26	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
27	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
28	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
29	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
30	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
31	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
32	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
33	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
34	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
35	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
36	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
37	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
38	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
39	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
40	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
41	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
42	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
43	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
44	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
45	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
46	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
47	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
48	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
49	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
50	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
51	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
52	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
53	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
54	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
55	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
56	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
57	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
58	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
59	312	4	443	9	1034	1334	1442	536	3	9	614	18	23
60	312	4	443	9	1034	1334	1442	536	3	9	614	18	23

For details of hubs and spigots, see table II; for details of side inlets, see fig. 28.

Note.—Dimensions X and X' are laying lengths.



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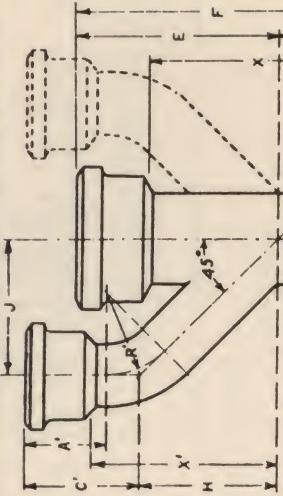


FIGURE 9.—Upright Y branches, single and double.
FIGURE 11.—Y branches, upright, single and double (fig. 9).

TABLE XVII.—Y branches, upright, single and double (figs. 9)

Size (inches)	Dimensions in inches 1								Weight, single double (pounds)	Weight double (pounds)
	A'	C'	E	F	G	H	J	R'	X	X'
2-----	2 ³ / ₄	4 ¹ / ₄	10 ¹ / ₄	4	4 ¹ / ₂	4 ¹ / ₄	3	8	6	16
3-----	3 ¹ / ₄	5 ¹ / ₄	13 ¹ / ₄	5	5 ¹ / ₂	5 ¹ / ₄	3 ¹ / ₂	10 ¹ / ₄	7 ¹ / ₂	30
4-----	3 ¹ / ₂	5 ¹ / ₂	9 ³ / ₄	15	5 ¹ / ₄	6 ¹ / ₂	6 ¹ / ₄	12	8 ¹ / ₂	42
5-----	3 ¹ / ₂	5 ¹ / ₂	5 ¹ / ₂	11	16 ¹ / ₄	5 ¹ / ₂	7 ¹ / ₂	7 ¹ / ₂	13 ¹ / ₄	53
6-----	3 ¹ / ₂	5 ¹ / ₂	5 ¹ / ₂	12 ¹ / ₄	18	5 ¹ / ₂	8 ¹ / ₄	8 ¹ / ₄	11 ¹ / ₂	37
3 by 2	3	4 ¹ / ₂	7 ¹ / ₂	11 ³ / ₄	14 ¹ / ₂	11 ³ / ₄	3	9	6 ¹ / ₂	70
4 by 2	4	5 ¹ / ₂	8 ¹ / ₂	13 ¹ / ₄	15 ¹ / ₂	5 ¹ / ₂	6	3 ¹ / ₂	16	20
4 by 3	4	5 ¹ / ₂	8 ¹ / ₂	13 ¹ / ₄	15 ¹ / ₂	5 ¹ / ₂	6	3 ¹ / ₂	19	24
5 by 2	5	6 ¹ / ₂	9 ¹ / ₂	14 ¹ / ₄	16 ¹ / ₂	6 ¹ / ₂	6	3 ¹ / ₂	23	34
5 by 3	5	6 ¹ / ₂	9 ¹ / ₂	14 ¹ / ₄	16 ¹ / ₂	6 ¹ / ₂	6	3 ¹ / ₂	23	34
5 by 4	5	6 ¹ / ₂	9 ¹ / ₂	14 ¹ / ₄	16 ¹ / ₂	6 ¹ / ₂	6	3 ¹ / ₂	23	34
6 by 2	6	7 ¹ / ₂	10 ¹ / ₄	15	10 ¹ / ₂	4 ¹ / ₂	7	4	12	37
6 by 3	6	7 ¹ / ₂	10 ¹ / ₄	15	10 ¹ / ₂	4 ¹ / ₂	7	4	12	37
6 by 4	6	7 ¹ / ₂	10 ¹ / ₄	15	10 ¹ / ₂	4 ¹ / ₂	7	4	12	37
6 by 5	6	7 ¹ / ₂	10 ¹ / ₄	15	10 ¹ / ₂	4 ¹ / ₂	7	4	12	37
5 by 5	5	6 ¹ / ₂	9 ¹ / ₂	14 ¹ / ₄	16 ¹ / ₂	6 ¹ / ₂	6 ₁ / ₂	3 ¹ / ₂	8 ¹ / ₂	30
6 by 6	6	7 ¹ / ₂	10 ¹ / ₄	15	10 ¹ / ₂	4 ¹ / ₂	7	4	12	37

Note.—Dimensions X and Y' are laying lengths.

¹ For details of hubs and spigots, see table II.

TABLE XVII.—Sanitary T branches, single (fig. 10)—Continued

Size (inches)	Dimensions in inches ¹							Weight, single (pounds)
	A'	B	E	E'	F	G	R'	
15 by 6	3 $\frac{1}{4}$	7	8 $\frac{3}{4}$	13	20 $\frac{3}{4}$	12	6	16 $\frac{1}{2}$
16 by 8	4 $\frac{1}{4}$	7	9 $\frac{3}{4}$	13 $\frac{1}{2}$	22 $\frac{3}{4}$	13	6	18 $\frac{1}{2}$
15 by 10	4 $\frac{1}{4}$	7	10 $\frac{1}{4}$	13 $\frac{1}{2}$	24 $\frac{3}{4}$	14	7	20 $\frac{1}{2}$
15 by 12	6	7	11 $\frac{1}{4}$	14 $\frac{1}{2}$	26 $\frac{3}{4}$	15	8	22 $\frac{1}{2}$

¹ For details of hubs and spigots, see table II. For details of side inlets, see fig. 28.

² Weights of sanitary T branches in lengths up to 36 inches are given in table X.LI.

Note.—Dimensions X and X' are laying lengths.

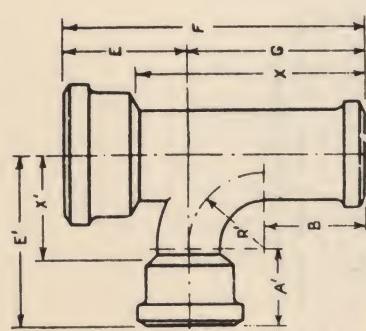


FIGURE 10.—Sanitary T branches, single (fig. 10)

TABLE XVII.—Sanitary T branches, single (fig. 10)

Size (inches)	Dimensions in inches ¹							Weight (pounds) ²
	A'	B	E	E'	F	G	R'	
2	2 $\frac{1}{4}$	3 $\frac{3}{4}$	5 $\frac{1}{4}$	10 $\frac{1}{4}$	6 $\frac{1}{4}$	2 $\frac{1}{4}$	8	2 $\frac{3}{4}$
3	3 $\frac{1}{4}$	4	6 $\frac{1}{4}$	12 $\frac{1}{4}$	7 $\frac{1}{4}$	3 $\frac{1}{4}$	10	4
4	3 $\frac{1}{4}$	4	6	7 $\frac{1}{4}$	8	4	11	4 $\frac{1}{4}$
5	3 $\frac{1}{4}$	4	6 $\frac{1}{4}$	8	8 $\frac{1}{4}$	4 $\frac{1}{2}$	12	2 $\frac{1}{2}$
6	3 $\frac{1}{4}$	4	7	8 $\frac{1}{4}$	9	5	13	5 $\frac{1}{2}$
8	4 $\frac{1}{4}$	5 $\frac{1}{4}$	8 $\frac{3}{4}$	10 $\frac{1}{4}$	20 $\frac{1}{4}$	6	17	6 $\frac{1}{2}$
10	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9 $\frac{1}{4}$	11 $\frac{1}{4}$	22 $\frac{1}{4}$	7	19	7 $\frac{1}{2}$
12	5	6	11 $\frac{1}{4}$	13	26 $\frac{1}{4}$	15	8	22 $\frac{1}{2}$
15	7	13 $\frac{1}{4}$	14 $\frac{1}{4}$	28 $\frac{1}{4}$	16 $\frac{1}{2}$	9 $\frac{1}{4}$	10 $\frac{1}{4}$	22 $\frac{1}{2}$
3 by 2	3	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	7	3	9	4
4 by 2	3	4	5	7	12	3	9	4 $\frac{1}{2}$
4 by 3	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	7 $\frac{1}{4}$	13	7 $\frac{1}{4}$	10	4 $\frac{1}{2}$
5 by 2	3 $\frac{1}{4}$	4	6	7 $\frac{1}{4}$	12	3 $\frac{1}{4}$	9	5
5 by 3	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	7 $\frac{1}{4}$	13	7 $\frac{1}{4}$	10	5 $\frac{1}{2}$
5 by 4	3 $\frac{1}{4}$	4	6	8	14	8	11	5 $\frac{1}{2}$
6 by 2	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	7 $\frac{1}{4}$	12	3 $\frac{1}{4}$	9	5 $\frac{1}{2}$
6 by 3	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	8 $\frac{1}{4}$	13	7 $\frac{1}{4}$	10	5 $\frac{1}{2}$
6 by 4	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	9 $\frac{1}{4}$	14	8	11	5 $\frac{1}{2}$
6 by 5	3 $\frac{1}{4}$	4	6	10 $\frac{1}{4}$	15 $\frac{1}{4}$	9	12	6 $\frac{1}{2}$
6 by 6	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	9 $\frac{1}{4}$	17 $\frac{1}{4}$	10 $\frac{1}{4}$	14	6 $\frac{1}{2}$
6 by 7	3 $\frac{1}{4}$	4	6	11 $\frac{1}{4}$	18 $\frac{1}{4}$	10 $\frac{1}{4}$	15	7 $\frac{1}{2}$
6 by 8	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	12 $\frac{1}{2}$	19 $\frac{1}{2}$	11 $\frac{1}{2}$	16	8 $\frac{1}{2}$
6 by 9	3 $\frac{1}{4}$	4	7	13 $\frac{1}{2}$	20 $\frac{1}{2}$	12 $\frac{1}{2}$	17	9 $\frac{1}{2}$
6 by 10	3 $\frac{1}{4}$	4	8	14 $\frac{1}{2}$	21 $\frac{1}{2}$	13 $\frac{1}{2}$	18	10 $\frac{1}{2}$
6 by 11	3 $\frac{1}{4}$	4	9	15 $\frac{1}{2}$	22 $\frac{1}{2}$	14 $\frac{1}{2}$	19	11 $\frac{1}{2}$
6 by 12	3 $\frac{1}{4}$	4	10	16 $\frac{1}{2}$	23 $\frac{1}{2}$	15 $\frac{1}{2}$	20	12 $\frac{1}{2}$
6 by 13	3 $\frac{1}{4}$	4	11	17 $\frac{1}{2}$	24 $\frac{1}{2}$	16 $\frac{1}{2}$	21	13 $\frac{1}{2}$
6 by 14	3 $\frac{1}{4}$	4	12	18 $\frac{1}{2}$	25 $\frac{1}{2}$	17 $\frac{1}{2}$	22	14 $\frac{1}{2}$
6 by 15	3 $\frac{1}{4}$	4	13	19 $\frac{1}{2}$	26 $\frac{1}{2}$	18 $\frac{1}{2}$	23	15 $\frac{1}{2}$
7 by 2	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	7 $\frac{1}{2}$	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
7 by 3	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	7 $\frac{1}{4}$	12	3 $\frac{1}{4}$	9	5 $\frac{1}{2}$
7 by 4	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	8 $\frac{1}{4}$	13	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
7 by 5	3 $\frac{1}{4}$	4	6	9 $\frac{1}{4}$	14	8	11	5 $\frac{1}{2}$
7 by 6	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	10 $\frac{1}{4}$	15 $\frac{1}{4}$	9	12	6 $\frac{1}{2}$
7 by 7	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	13	7 $\frac{1}{2}$
7 by 8	3 $\frac{1}{4}$	4	7	12 $\frac{1}{2}$	17 $\frac{1}{2}$	11 $\frac{1}{2}$	14	8 $\frac{1}{2}$
7 by 9	3 $\frac{1}{4}$	4	8	13 $\frac{1}{2}$	18 $\frac{1}{2}$	12 $\frac{1}{2}$	15	9 $\frac{1}{2}$
7 by 10	3 $\frac{1}{4}$	4	9	14 $\frac{1}{2}$	19 $\frac{1}{2}$	13 $\frac{1}{2}$	16	10 $\frac{1}{2}$
7 by 11	3 $\frac{1}{4}$	4	10	15 $\frac{1}{2}$	20 $\frac{1}{2}$	14 $\frac{1}{2}$	17	11 $\frac{1}{2}$
7 by 12	3 $\frac{1}{4}$	4	11	16 $\frac{1}{2}$	21 $\frac{1}{2}$	15 $\frac{1}{2}$	18	12 $\frac{1}{2}$
7 by 13	3 $\frac{1}{4}$	4	12	17 $\frac{1}{2}$	22 $\frac{1}{2}$	16 $\frac{1}{2}$	19	13 $\frac{1}{2}$
8 by 2	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	7 $\frac{1}{2}$	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
8 by 3	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	7 $\frac{1}{4}$	12	3 $\frac{1}{4}$	9	5 $\frac{1}{2}$
8 by 4	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	8 $\frac{1}{4}$	13	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
8 by 5	3 $\frac{1}{4}$	4	6	9 $\frac{1}{4}$	14	8	11	5 $\frac{1}{2}$
8 by 6	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	10 $\frac{1}{4}$	15 $\frac{1}{4}$	9	12	6 $\frac{1}{2}$
8 by 7	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	13	7 $\frac{1}{2}$
8 by 8	3 $\frac{1}{4}$	4	7	12 $\frac{1}{2}$	17 $\frac{1}{2}$	11 $\frac{1}{2}$	14	8 $\frac{1}{2}$
8 by 9	3 $\frac{1}{4}$	4	8	13 $\frac{1}{2}$	18 $\frac{1}{2}$	12 $\frac{1}{2}$	15	9 $\frac{1}{2}$
8 by 10	3 $\frac{1}{4}$	4	9	14 $\frac{1}{2}$	19 $\frac{1}{2}$	13 $\frac{1}{2}$	16	10 $\frac{1}{2}$
8 by 11	3 $\frac{1}{4}$	4	10	15 $\frac{1}{2}$	20 $\frac{1}{2}$	14 $\frac{1}{2}$	17	11 $\frac{1}{2}$
8 by 12	3 $\frac{1}{4}$	4	11	16 $\frac{1}{2}$	21 $\frac{1}{2}$	15 $\frac{1}{2}$	18	12 $\frac{1}{2}$
8 by 13	3 $\frac{1}{4}$	4	12	17 $\frac{1}{2}$	22 $\frac{1}{2}$	16 $\frac{1}{2}$	19	13 $\frac{1}{2}$
9 by 2	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	7 $\frac{1}{2}$	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
9 by 3	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	7 $\frac{1}{4}$	12	3 $\frac{1}{4}$	9	5 $\frac{1}{2}$
9 by 4	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	8 $\frac{1}{4}$	13	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
9 by 5	3 $\frac{1}{4}$	4	6	9 $\frac{1}{4}$	14	8	11	5 $\frac{1}{2}$
9 by 6	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	10 $\frac{1}{4}$	15 $\frac{1}{4}$	9	12	6 $\frac{1}{2}$
9 by 7	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	13	7 $\frac{1}{2}$
9 by 8	3 $\frac{1}{4}$	4	7	12 $\frac{1}{2}$	17 $\frac{1}{2}$	11 $\frac{1}{2}$	14	8 $\frac{1}{2}$
9 by 9	3 $\frac{1}{4}$	4	8	13 $\frac{1}{2}$	18 $\frac{1}{2}$	12 $\frac{1}{2}$	15	9 $\frac{1}{2}$
9 by 10	3 $\frac{1}{4}$	4	9	14 $\frac{1}{2}$	19 $\frac{1}{2}$	13 $\frac{1}{2}$	16	10 $\frac{1}{2}$
9 by 11	3 $\frac{1}{4}$	4	10	15 $\frac{1}{2}$	20 $\frac{1}{2}$	14 $\frac{1}{2}$	17	11 $\frac{1}{2}$
9 by 12	3 $\frac{1}{4}$	4	11	16 $\frac{1}{2}$	21 $\frac{1}{2}$	15 $\frac{1}{2}$	18	12 $\frac{1}{2}$
9 by 13	3 $\frac{1}{4}$	4	12	17 $\frac{1}{2}$	22 $\frac{1}{2}$	16 $\frac{1}{2}$	19	13 $\frac{1}{2}$
10 by 2	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	7 $\frac{1}{2}$	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
10 by 3	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	7 $\frac{1}{4}$	12	3 $\frac{1}{4}$	9	5 $\frac{1}{2}$
10 by 4	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	8 $\frac{1}{4}$	13	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
10 by 5	3 $\frac{1}{4}$	4	6	9 $\frac{1}{4}$	14	8	11	5 $\frac{1}{2}$
10 by 6	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	10 $\frac{1}{4}$	15 $\frac{1}{4}$	9	12	6 $\frac{1}{2}$
10 by 7	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	13	7 $\frac{1}{2}$
10 by 8	3 $\frac{1}{4}$	4	7	12 $\frac{1}{2}$	17 $\frac{1}{2}$	11 $\frac{1}{2}$	14	8 $\frac{1}{2}$
10 by 9	3 $\frac{1}{4}$	4	8	13 $\frac{1}{2}$	18 $\frac{1}{2}$	12 $\frac{1}{2}$	15	9 $\frac{1}{2}$
10 by 10	3 $\frac{1}{4}$	4	9	14 $\frac{1}{2}$	19 $\frac{1}{2}$	13 $\frac{1}{2}$	16	10 $\frac{1}{2}$
10 by 11	3 $\frac{1}{4}$	4	10	15 $\frac{1}{2}$	20 $\frac{1}{2}$	14 $\frac{1}{2}$	17	11 $\frac{1}{2}$
10 by 12	3 $\frac{1}{4}$	4	11	16 $\frac{1}{2}$	21 $\frac{1}{2}$	15 $\frac{1}{2}$	18	12 $\frac{1}{2}$
10 by 13	3 $\frac{1}{4}$	4	12	17 $\frac{1}{2}$	22 $\frac{1}{2}$	16 $\frac{1}{2}$	19	13 $\frac{1}{2}$
11 by 2	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	7 $\frac{1}{2}$	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
11 by 3	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	7 $\frac{1}{4}$	12	3 $\frac{1}{4}$	9	5 $\frac{1}{2}$
11 by 4	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	8 $\frac{1}{4}$	13	3 $\frac{1}{4}$	10	5 $\frac{1}{2}$
11 by 5	3 $\frac{1}{4}$	4	6	9 $\frac{1}{4}$	14	8	11	5 $\frac{1}{2}$
11 by 6	3 $\frac{1}{4}$	4	5 $\frac{1}{4}$	10 $\frac{1}{4}$	15 $\frac{1}{4}$	9	12	6 $\frac{1}{2}$
11 by 7	3 $\frac{1}{4}$	4	6 $\frac{1}{2}$	11 $\frac{1}{2}$	16 $\frac{1}{2}$	10 $\frac{1}{2}$	13	7 $\frac{1}{2}$
11 by 8	3 $\frac{1}{4}$	4	7	12 $\frac{1}{2}$	17 $\frac{1}{2}$	11 $\frac{1}{2}$	14	8 $\frac{1}{2}$
11 by 9	3 $\frac{1}{4}$	4	8	13 $\frac{1}{2}$	18 $\frac{1}{2}$	12 $\frac{1}{2}$	15	9 $\frac{1}{2}$
11 by 10	3 $\frac{1}{4}$	4	9	14 $\frac{1}{2}$				

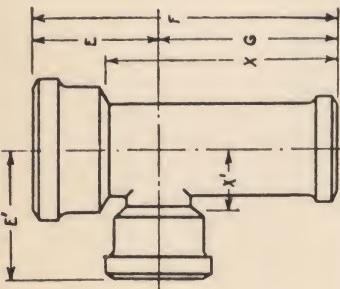


TABLE XIX.—T branches, single (note 1) (fig. 12)

Size (inches)	Dimensions in inches ¹					Weight (pounds) ²
	E	E'	F	G	X	
2	4 $\frac{1}{4}$	10 $\frac{3}{4}$	6 $\frac{3}{4}$	8	1 $\frac{1}{4}$	8
3	5 $\frac{1}{4}$	12 $\frac{1}{4}$	7 $\frac{1}{4}$	10	2 $\frac{1}{4}$	16
4	6	14	8	11	3	21
5	6 $\frac{1}{4}$	15	8 $\frac{1}{4}$	12	3 $\frac{1}{4}$	26
6	7	16	9	13	4	32
8	8 $\frac{1}{4}$	20 $\frac{1}{4}$	11 $\frac{3}{4}$	17	6 $\frac{1}{4}$	67
10	9 $\frac{1}{4}$	22 $\frac{1}{4}$	12 $\frac{3}{4}$	19	6 $\frac{1}{4}$	106
12	11 $\frac{3}{4}$	26 $\frac{3}{4}$	15	22 $\frac{1}{4}$	7 $\frac{1}{4}$	160
15	13 $\frac{1}{4}$	20 $\frac{3}{4}$	16 $\frac{1}{4}$	25 $\frac{1}{4}$	9	225
3 by 2	4 $\frac{1}{4}$	5	11 $\frac{3}{4}$	7	2 $\frac{1}{4}$	13
4 by 2	5	5 $\frac{1}{4}$	12	7	9	16
4 by 3	5 $\frac{1}{4}$	5 $\frac{1}{4}$	10	10	3	19
5 by 2	5	6	12	7	9	19
5 by 3	5 $\frac{1}{4}$	6	12	7 $\frac{1}{4}$	3 $\frac{1}{4}$	22
5 by 4	6	6 $\frac{1}{4}$	14	8	11	24
6 by 2	5	6 $\frac{1}{4}$	12	7	9	22
6 by 3	5 $\frac{1}{4}$	6 $\frac{1}{4}$	13	7 $\frac{1}{4}$	4	25
6 by 4	6	7	14	8	11	27
6 by 5	6 $\frac{1}{4}$	7	15	8 $\frac{1}{4}$	12	30
8 by 2	5 $\frac{1}{4}$	7 $\frac{1}{4}$	14 $\frac{1}{4}$	8 $\frac{1}{4}$	11	43
8 by 3	6 $\frac{1}{4}$	8 $\frac{1}{4}$	15 $\frac{1}{4}$	9 $\frac{1}{4}$	12	47
8 by 4	6 $\frac{1}{4}$	8 $\frac{1}{4}$	16 $\frac{1}{4}$	9 $\frac{1}{4}$	13	50
8 by 5	7 $\frac{1}{4}$	17 $\frac{1}{4}$	10 $\frac{1}{4}$	10 $\frac{1}{4}$	14	53
8 by 6	7 $\frac{1}{4}$	8 $\frac{1}{4}$	18 $\frac{1}{4}$	10 $\frac{1}{4}$	15	55
10 by 4	9 $\frac{1}{4}$	9 $\frac{1}{4}$	16 $\frac{1}{4}$	9 $\frac{1}{4}$	13	64
10 by 5	7 $\frac{1}{4}$	7 $\frac{1}{4}$	17 $\frac{1}{4}$	10 $\frac{1}{4}$	14	70
10 by 6	7 $\frac{1}{4}$	7 $\frac{1}{4}$	18 $\frac{1}{4}$	10 $\frac{1}{4}$	16	74
10 by 8	7 $\frac{1}{4}$	7 $\frac{1}{4}$	20 $\frac{1}{4}$	11 $\frac{1}{4}$	17	93
12 by 4	7 $\frac{1}{4}$	10 $\frac{1}{4}$	18 $\frac{1}{4}$	11 $\frac{1}{4}$	14 $\frac{1}{4}$	93
12 by 5	8	10 $\frac{1}{4}$	19 $\frac{1}{4}$	12 $\frac{1}{4}$	15 $\frac{1}{4}$	100
12 by 6	8 $\frac{1}{4}$	10 $\frac{1}{4}$	20 $\frac{1}{4}$	12 $\frac{1}{4}$	16 $\frac{1}{4}$	117
12 by 8	9 $\frac{1}{4}$	10 $\frac{1}{4}$	22 $\frac{1}{4}$	13	18 $\frac{1}{4}$	130
12 by 10	10 $\frac{1}{4}$	10 $\frac{1}{4}$	23 $\frac{1}{4}$	14	20 $\frac{1}{4}$	140
15 by 6	8 $\frac{1}{2}$	11 $\frac{1}{4}$	20 $\frac{1}{4}$	12 $\frac{1}{4}$	16 $\frac{1}{4}$	89 $\frac{1}{4}$
15 by 8	9 $\frac{1}{4}$	12 $\frac{1}{4}$	22 $\frac{1}{4}$	13	18 $\frac{1}{4}$	160
15 by 10	10 $\frac{1}{4}$	12 $\frac{1}{4}$	24 $\frac{1}{4}$	14	20 $\frac{1}{4}$	177
15 by 12	11 $\frac{1}{4}$	13 $\frac{1}{4}$	26 $\frac{1}{4}$	15	22 $\frac{1}{4}$	196

¹ For details of hubs and spigots, see table II.

² Weights of T branches in lengths up to 36 inches are given in table XII.

Note 1.—T branches are intended for venting and cleanout purposes only, and branch openings are not intended for use as waste inlets.

Note 2.—Dimension X is the laying length.

Note 3.—Dimensions and weights given apply to branches tapped 1 $\frac{1}{4}$, 1 $\frac{1}{2}$, and 2 inches, I. P. S.

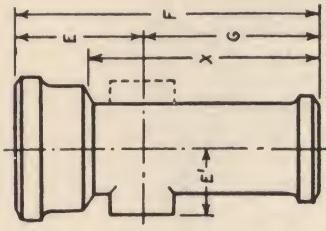


FIGURE 13.—Tapped T branches, single and double (note 1) (fig. 13)

Size (inches)	Dimensions in inches ¹					Weight (pounds) ²
	E	E'	F	G	X	
2	4 $\frac{1}{4}$	10 $\frac{3}{4}$	6 $\frac{3}{4}$	8	1 $\frac{1}{4}$	8
3	5 $\frac{1}{4}$	12 $\frac{1}{4}$	7 $\frac{1}{4}$	10	2 $\frac{1}{4}$	16
4	6	14	8	11	3	21
5	6 $\frac{1}{4}$	15	8 $\frac{1}{4}$	12	3 $\frac{1}{4}$	26
6	7	16	9	13	4	32
8	8 $\frac{1}{4}$	20 $\frac{1}{4}$	11 $\frac{3}{4}$	17	6 $\frac{1}{4}$	67
10	9 $\frac{1}{4}$	22 $\frac{1}{4}$	12 $\frac{3}{4}$	19	6 $\frac{1}{4}$	106
12	11 $\frac{3}{4}$	26 $\frac{3}{4}$	15	22 $\frac{1}{4}$	7 $\frac{1}{4}$	160
15	13 $\frac{1}{4}$	20 $\frac{3}{4}$	16 $\frac{1}{4}$	25 $\frac{1}{4}$	9	225
3 by 2	4 $\frac{1}{4}$	5	11 $\frac{3}{4}$	7	2 $\frac{1}{4}$	13
4 by 2	5	5 $\frac{1}{4}$	12	7	9	16
4 by 3	5 $\frac{1}{4}$	5 $\frac{1}{4}$	10	10	3	19
5 by 2	5	6	12	7	9	19
5 by 3	5 $\frac{1}{4}$	6	12	7 $\frac{1}{4}$	3 $\frac{1}{4}$	22
5 by 4	6	6 $\frac{1}{4}$	14	8	11	24
6 by 2	5	6 $\frac{1}{4}$	12	7	9	22
6 by 3	5 $\frac{1}{4}$	6 $\frac{1}{4}$	13	7 $\frac{1}{4}$	4	25
6 by 4	6	7	14	8	11	27
6 by 5	6 $\frac{1}{4}$	7	15	8 $\frac{1}{4}$	12	30
8 by 2	5 $\frac{1}{4}$	7 $\frac{1}{4}$	14 $\frac{1}{4}$	8 $\frac{1}{4}$	11	43
8 by 3	6 $\frac{1}{4}$	8 $\frac{1}{4}$	15 $\frac{1}{4}$	9 $\frac{1}{4}$	12	47
8 by 4	6 $\frac{1}{4}$	8 $\frac{1}{4}$	16 $\frac{1}{4}$	9 $\frac{1}{4}$	13	50
8 by 5	7 $\frac{1}{4}$	17 $\frac{1}{4}$	10 $\frac{1}{4}$	10 $\frac{1}{4}$	14	53
8 by 6	7 $\frac{1}{4}$	8 $\frac{1}{4}$	18 $\frac{1}{4}$	10 $\frac{1}{4}$	15	55
10 by 4	9 $\frac{1}{4}$	9 $\frac{1}{4}$	16 $\frac{1}{4}$	9 $\frac{1}{4}$	13	64
10 by 5	7 $\frac{1}{4}$	7 $\frac{1}{4}$	17 $\frac{1}{4}$	10 $\frac{1}{4}$	14	70
10 by 6	7 $\frac{1}{4}$	7 $\frac{1}{4}$	18 $\frac{1}{4}$	10 $\frac{1}{4}$	16	74
10 by 8	7 $\frac{1}{4}$	7 $\frac{1}{4}$	20 $\frac{1}{4}$	11 $\frac{1}{4}$	17	93
12 by 4	7 $\frac{1}{4}$	10 $\frac{1}{4}$	18 $\frac{1}{4}$	11 $\frac{1}{4}$	14 $\frac{1}{4}$	93
12 by 5	8	10 $\frac{1}{4}$	19 $\frac{1}{4}$	12 $\frac{1}{4}$	15 $\frac{1}{4}$	100
12 by 6	8 $\frac{1}{4}$	10 $\frac{1}{4}$	20 $\frac{1}{4}$	12 $\frac{1}{4}$	16 $\frac{1}{4}$	117
12 by 8	9 $\frac{1}{4}$	10 $\frac{1}{4}$	22 $\frac{1}{4}$	13	18 $\frac{1}{4}$	130
12 by 10	10 $\frac{1}{4}$	10 $\frac{1}{4}$	23 $\frac{1}{4}$	14	20 $\frac{1}{4}$	140
15 by 6	8 $\frac{1}{2}$	11 $\frac{1}{4}$	20 $\frac{1}{4}$	12 $\frac{1}{4}$	16 $\frac{1}{4}$	89 $\frac{1}{4}$
15 by 8	9 $\frac{1}{4}$	12 $\frac{1}{4}$	22 $\frac{1}{4}$	13	18 $\frac{1}{4}$	160
15 by 10	10 $\frac{1}{4}$	12 $\frac{1}{4}$	24 $\frac{1}{4}$	14	20 $\frac{1}{4}$	177
15 by 12	11 $\frac{1}{4}$	13 $\frac{1}{4}$	26 $\frac{1}{4}$	15	22 $\frac{1}{4}$	196

¹ For details of hubs and spigots, see table II.

² Weights of tapped T branches in 18- and 24-inch lengths are given in table XII.

Note 1.—Tapped T branches are intended for venting and cleanout purposes only, and branch openings are not intended for use as waste inlets.

Note 2.—Dimension X is the laying length.

Note 3.—Dimensions and weights given apply to branches tapped 1 $\frac{1}{4}$, 1 $\frac{1}{2}$, and 2 inches, I. P. S.

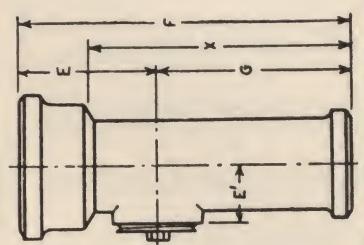


FIGURE 14.—T branch cleanout with screw plug (fig. 14).

TABLE XXI.—T branch cleanout with screw plug (fig. 14)

Size (inches)	Dimensions in inches:				I. P. S. tapping	Weight without plug (pounds)
	E	E'	F	G		
4 $\frac{1}{4}$	2	10 $\frac{1}{4}$	6 $\frac{1}{4}$	8	1 $\frac{1}{4}$	7
5 $\frac{1}{4}$	2 $\frac{1}{4}$	12 $\frac{1}{4}$	7 $\frac{1}{4}$	10	2 $\frac{1}{4}$	13
6	3 $\frac{1}{4}$	14	8	11	3 $\frac{1}{4}$	17
6 $\frac{1}{4}$	3 $\frac{1}{4}$	15	8 $\frac{1}{4}$	12	4 $\frac{1}{4}$	22
7	4	16	9	13	5	28

¹ For details of hubs and spigots, see table II; for details of tapping bosses, see table XL.

NOTE: Dimension X is the laying length.

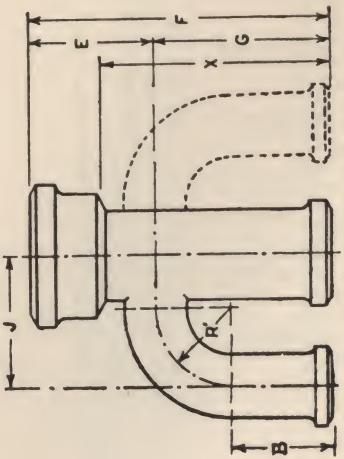


FIGURE 16.—Vent branches, single and double.

TABLE XXXII.—Vent branches, single and double (fig. 15)

Size (inches)	Dimensions in inches: ¹							Weight, single (pounds)	Weight, double (pounds)
	B	E	F	G	J	R'	X		
2	3 $\frac{1}{4}$	4 $\frac{1}{4}$	10 $\frac{1}{4}$	6 $\frac{1}{4}$	4 $\frac{1}{4}$	3	8	9	12
3	4	5 $\frac{1}{2}$	12 $\frac{1}{2}$	7 $\frac{1}{2}$	5 $\frac{1}{2}$	3 $\frac{1}{2}$	10	18	23
4	4	6	14	8 $\frac{1}{2}$	6 $\frac{1}{2}$	4	11	25	32
5	4	6 $\frac{1}{2}$	15	8 $\frac{1}{2}$	7 $\frac{1}{2}$	4 $\frac{1}{2}$	12	32	41
6	4	7	16	9	8 $\frac{1}{2}$	5	13	41	51
6 by 2	4	7 $\frac{1}{2}$	11 $\frac{1}{2}$	7	6 $\frac{1}{2}$	3	9	14	17
6 by 4	4	12	7	6 $\frac{1}{2}$	3	9	18	21	26
6 by 5	4	13	7 $\frac{1}{2}$	6	3 $\frac{1}{2}$	10	21	24	30
6 by 6	4	12	7 $\frac{1}{2}$	6	3 $\frac{1}{2}$	9	21	24	30
6 by 7	4	13	7 $\frac{1}{2}$	6	3 $\frac{1}{2}$	10	24	28	35
6 by 8	4	14	8	7 $\frac{1}{2}$	4	11	26	29	35
6 by 9	4	13	7 $\frac{1}{2}$	6 $\frac{1}{2}$	3	9	22	25	32
6 by 10	4	14	8	7 $\frac{1}{2}$	3 $\frac{1}{2}$	10	27	30	38
6 by 11	4	15	8 $\frac{1}{2}$	7 $\frac{1}{2}$	4	11	31	34	42

¹ For details of hubs and spigots, see table II.

NOTE.—Dimension X is the laying length.

TABLE XXIV.— $\frac{3}{8}$ bend offset, 3-inch (fig. 16)

Size (inches)	Dimensions in inches ¹							Weight (pounds)
	A	B	C	D	F	H	J	
3 by 2	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	11 $\frac{1}{4}$	2	2 $\frac{1}{4}$	8 $\frac{1}{4}$
3 by 4	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	13 $\frac{1}{4}$	4	4	10 $\frac{1}{4}$
3 by 6	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	15 $\frac{1}{4}$	6	6 $\frac{1}{4}$	12 $\frac{1}{4}$
3 by 8	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	17 $\frac{1}{4}$	8	8	14 $\frac{1}{4}$
3 by 10	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	19 $\frac{1}{4}$	10	10 $\frac{1}{4}$	16
3 by 12	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	21 $\frac{1}{4}$	12	12 $\frac{1}{4}$	18
3 by 14	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	23 $\frac{1}{4}$	14	14 $\frac{1}{4}$	20
3 by 16	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	25 $\frac{1}{4}$	16	16 $\frac{1}{4}$	22
3 by 18	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	27 $\frac{1}{4}$	18	18 $\frac{1}{4}$	24
3 by 20	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	29 $\frac{1}{4}$	20	20 $\frac{1}{4}$	26
3 by 22	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	31 $\frac{1}{4}$	22	22 $\frac{1}{4}$	28
3 by 24	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	5	33 $\frac{1}{4}$	24	24 $\frac{1}{4}$	30 $\frac{1}{4}$

¹ For details of hubs and spigots, see table II.
Note.—Dimension X is the laying length.

TABLE XXV.— $\frac{3}{8}$ bend offset, 4-inch (fig. 16)

Size (inches)	Dimensions in inches ¹							Weight (pounds)
	A	B	C	D	F	H	J	
4 by 2	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	12 $\frac{1}{4}$	2	2	9
4 by 4	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	14 $\frac{1}{4}$	4	4	11
4 by 6	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	16 $\frac{1}{4}$	6	6	13
4 by 8	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	18 $\frac{1}{4}$	8	8	15
4 by 10	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	20 $\frac{1}{4}$	10	10 $\frac{1}{4}$	17
4 by 12	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	22 $\frac{1}{4}$	12	12 $\frac{1}{4}$	19
4 by 14	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	24 $\frac{1}{4}$	14	14 $\frac{1}{4}$	21
4 by 16	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	26 $\frac{1}{4}$	16	16 $\frac{1}{4}$	23
4 by 18	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	28 $\frac{1}{4}$	18	18 $\frac{1}{4}$	25
4 by 20	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	30 $\frac{1}{4}$	20	20 $\frac{1}{4}$	27
4 by 22	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	32 $\frac{1}{4}$	22	22 $\frac{1}{4}$	29
4 by 24	3 $\frac{1}{4}$	4	4 $\frac{1}{4}$	6	34 $\frac{1}{4}$	24	24 $\frac{1}{4}$	31

¹ For details of hubs and spigots, see table II.
Note.—Dimension X is the laying length.

TABLE XXIII.— $\frac{3}{8}$ bend offset, 2-inch (fig. 16)

Size (inches)	Dimensions in inches ¹							Weight (pounds)
	A	B	C	D	F	H	J	
2 by 2	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	2	2 $\frac{1}{4}$	6		
2 by 4	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	4	4 $\frac{1}{4}$	11 $\frac{1}{4}$		
2 by 6	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	6	6	13 $\frac{1}{4}$		
2 by 8	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	8	8	15 $\frac{1}{4}$		
2 by 10	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	10	10	17 $\frac{1}{4}$		
2 by 12	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	12	12	19 $\frac{1}{4}$		
2 by 14	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	14	14	21 $\frac{1}{4}$		
2 by 16	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	16	16	23 $\frac{1}{4}$		
2 by 18	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	18	18	25 $\frac{1}{4}$		
2 by 20	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	20	20	27 $\frac{1}{4}$		
2 by 22	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	22	22	29 $\frac{1}{4}$		
2 by 24	2 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	24	24	31 $\frac{1}{4}$		

¹ For details of hubs and spigots, see table II.
Note.—Dimension X is the laying length.

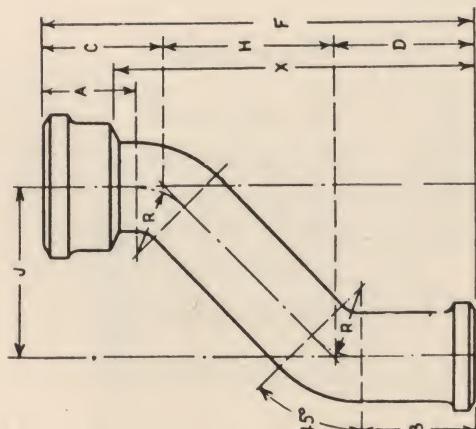


FIGURE 16.— $\frac{3}{8}$ bend offset.

TABLE XXVI.— $\frac{1}{4}$ bend offset, 5-inch (fig. 16)

Size (inches)	Dimensions in inches ¹							Weight (pounds)
	A	B	C	D	F	H	J	
6 by 2	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	12 $\frac{1}{4}$	2	3 $\frac{1}{4}$
6 by 4	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	14 $\frac{1}{4}$	4	9 $\frac{1}{4}$
6 by 6	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	16 $\frac{1}{4}$	6	11 $\frac{1}{4}$
6 by 8	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	18 $\frac{1}{4}$	8	13 $\frac{1}{4}$
6 by 10	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	20 $\frac{1}{4}$	10	15 $\frac{1}{4}$
6 by 12	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	22 $\frac{1}{4}$	12	17 $\frac{1}{4}$
6 by 14	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	24 $\frac{1}{4}$	14	19 $\frac{1}{4}$
6 by 16	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	26 $\frac{1}{4}$	16	21 $\frac{1}{4}$
6 by 18	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	28 $\frac{1}{4}$	18	23 $\frac{1}{4}$
6 by 20	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	30 $\frac{1}{4}$	20	25 $\frac{1}{4}$
6 by 22	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	32 $\frac{1}{4}$	22	27 $\frac{1}{4}$
6 by 24	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	34 $\frac{1}{4}$	24	31 $\frac{1}{4}$

¹ For details of hubs and spigots, see table II.
Note.—Dimension X is the laying length.

TABLE XXVII.— $\frac{1}{4}$ bend offset, 6-inch (fig. 16)

Size (inches)	Dimensions in inches ¹							Weight (pounds)
	A	B	C	D	F	H	J	
6 by 2	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	13	2 $\frac{1}{4}$	4	10	21
6 by 4	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	15	4	4	12	25
6 by 6	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	17	6	4	14	28
6 by 8	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	19	8	4	16	32
6 by 10	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	21	10	4	18	36
6 by 12	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	23	12	4	20	39
6 by 14	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	25	14	4	22	43
6 by 16	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	27	16	4	24	46
6 by 18	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	29	18	4	26	50
6 by 20	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	31	20	4	28	54
6 by 22	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	33	22	4	30	57
6 by 24	4 $\frac{1}{4}$	6	6 $\frac{1}{4}$	35	24	4	32	61

¹ For details of hubs and spigots, see table II.
Note.—Dimension X is the laying length.

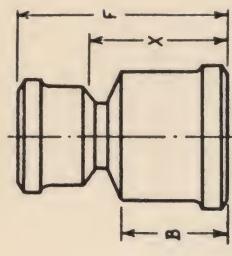


FIGURE 16.—Single hub.

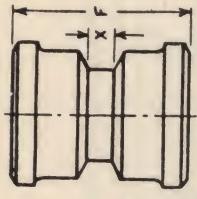


FIGURE 17.—Double hub.

TABLE XXVIII.—Double hub (fig. 17)¹

Size (inches)	F	X	Weight Pounds	Size (inches)			F	X	Weight Pounds
				8	10	12			
8 by 2	4 $\frac{1}{4}$	17 $\frac{1}{4}$	26	8	10	12	—	—	—
8 by 4	4 $\frac{1}{4}$	17 $\frac{1}{4}$	52	10	12	14	—	—	—
8 by 6	4 $\frac{1}{4}$	17 $\frac{1}{4}$	88	12	14	16	—	—	—
8 by 8	4 $\frac{1}{4}$	17 $\frac{1}{4}$	124	14	16	18	—	—	—
8 by 10	4 $\frac{1}{4}$	17 $\frac{1}{4}$	160	16	18	20	—	—	—
8 by 12	4 $\frac{1}{4}$	17 $\frac{1}{4}$	196	18	20	22	—	—	—
8 by 14	4 $\frac{1}{4}$	17 $\frac{1}{4}$	232	20	22	24	—	—	—
8 by 16	4 $\frac{1}{4}$	17 $\frac{1}{4}$	268	22	24	26	—	—	—
8 by 18	4 $\frac{1}{4}$	17 $\frac{1}{4}$	304	24	26	28	—	—	—
8 by 20	4 $\frac{1}{4}$	17 $\frac{1}{4}$	340	26	28	30	—	—	—
8 by 22	4 $\frac{1}{4}$	17 $\frac{1}{4}$	376	28	30	32	—	—	—
8 by 24	4 $\frac{1}{4}$	17 $\frac{1}{4}$	412	30	32	34	—	—	—

¹ For details of hubs and spigots, see table II.
Note.—Dimension X is the laying length.

FIGURE 18.—Reducer.

FIGURE 19.—Hub (fig. 18).

TABLE XXIX.—Reducers (fig. 18)¹

Size (inches)	B	F	X	Weight Pounds	Size (inches)			B	F	X	Weight Pounds
					8 by 6	10 by 8	12 by 10				
8 by 6	4 $\frac{1}{4}$	3 $\frac{1}{4}$	6	6	8	10	12	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	6
8 by 8	4 $\frac{1}{4}$	3 $\frac{1}{4}$	12	12	14	16	18	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	12
8 by 10	4 $\frac{1}{4}$	3 $\frac{1}{4}$	18	18	20	24	26	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	24
8 by 12	4 $\frac{1}{4}$	3 $\frac{1}{4}$	24	24	26	30	32	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	48
8 by 14	4 $\frac{1}{4}$	3 $\frac{1}{4}$	30	30	32	36	38	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	72
8 by 16	4 $\frac{1}{4}$	3 $\frac{1}{4}$	36	36	38	42	44	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	96
8 by 18	4 $\frac{1}{4}$	3 $\frac{1}{4}$	42	42	44	48	50	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	120
8 by 20	4 $\frac{1}{4}$	3 $\frac{1}{4}$	48	48	50	54	56	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	144
8 by 22	4 $\frac{1}{4}$	3 $\frac{1}{4}$	54	54	56	60	62	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	168
8 by 24	4 $\frac{1}{4}$	3 $\frac{1}{4}$	60	60	62	66	68	4 $\frac{1}{4}$	5 $\frac{1}{4}$	9	192

¹ For hub and spigot details, see table II.
Note.—Dimension X is the laying length.

FIGURE 20.—Hub (fig. 19).

FIGURE 21.—Hub (fig. 19).

FIGURE 22.—Hub (fig. 19).

FIGURE 23.—Hub (fig. 19).

FIGURE 24.—Hub (fig. 19).

FIGURE 25.—Hub (fig. 19).

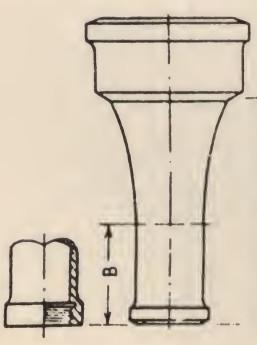


TABLE XXX.—*Increaser* (fig. 19)¹

Size (inches)	B	F	X	Weight	Size (inches)	B	F	X	Weight				
Inches	Inches	Inches	Pounds	Inches	Inches	Inches	Pounds	Inches	Inches				
2 by 3.....	4	1 1/4	9	5 by 8.....	4	15 1/2	12	34	2 by 4 by 24.....	8 1/2	4	4 1/2	19
2 by 4.....	4	1 1/2	9	5 by 10.....	4	15 1/2	12	44	2 by 4 by 30.....	8 1/2	4	4 1/2	23
2 by 5.....	4	1 1/2	9	6 by 8.....	4	15 1/2	12	35	2 by 4 by 36.....	8 1/2	4	4 1/2	27
2 by 6.....	4	1 1/2	9	6 by 10.....	4	15 1/2	12	45	2 by 4 by 48.....	8 1/2	4	4 1/2	39
3 by 4.....	4	1 1/2	9	6 by 12.....	4	16 1/2	12	58	3 by 4 by 24.....	8 1/2	4	4 1/2	40
3 by 5.....	4	1 1/2	9	8 by 10.....	4	15 1/2	12	55	3 by 4 by 30.....	8 1/2	4	4 1/2	48
3 by 6.....	4	1 1/2	9	8 by 12.....	5 1/2	16 1/2	12	64	3 by 4 by 36.....	8 1/2	4	4 1/2	52
4 by 5.....	4	1 1/2	9	8 by 15.....	5 1/2	16 1/2	12	75	3 by 4 by 48.....	8 1/2	4	4 1/2	61
4 by 6.....	4	1 1/2	9	10 by 12.....	5 1/2	16 1/2	12	77	4 by 5 by 24.....	8 1/2	4	4 1/2	42
4 by 8.....	4	1 1/2	12	10 by 15.....	5 1/2	16 1/2	12	88	4 by 5 by 30.....	8 1/2	4	4 1/2	25
5 by 6.....	4	1 1/2	12	10 by 15.....	7	16 1/2	12	97	4 by 5 by 36.....	8 1/2	4	4 1/2	31
				12 by 15.....	7	16 1/2	12		4 by 5 by 48.....	8 1/2	4	4 1/2	33
									4 by 6 by 24.....	8 1/2	4	4 1/2	39
									4 by 6 by 30.....	8 1/2	4	4 1/2	52
									4 by 6 by 36.....	8 1/2	4	4 1/2	61
									4 by 6 by 48.....	8 1/2	4	4 1/2	59

¹ For hub and spigot dets. " see table II.
NOTE.—Dimension X is the laying length.

TABLE XXXI.—*Increaser*, tapped (fig. 19)¹

Size (inches) (note 1)	B	F	X	Weight
Inches	Inches	Inches	Pounds	
1 1/2 by 2.....	4	10 1/2	8	7
2 by 3.....	4	11 1/2	9	9
2 by 4.....	4	12	9	11
2 by 5.....	4	12	9	12
2 by 6.....	4	12	9	14

¹ For hub details, see table II.

NOTE 1.—Tapping boss may be tapped for 1 1/4, 1 1/2, or 2-inch pipes, except size 1 1/4 by 2 inches, which may be tapped 1 1/4 or 1 1/2 inches only. For tapping boss details see table XL.

NOTE 2.—Dimension X is the laying length.

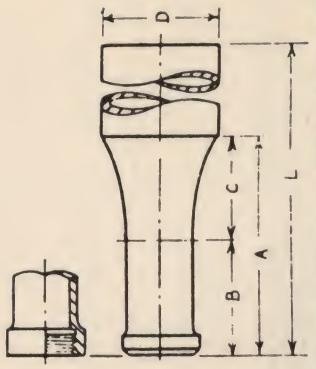


FIGURE 20.—*Long Increaser, Spigot and Tapped*.

TABLE XXXII.—*Long Increaser, Spigot and Tapped* (fig. 20)

Size (inches)	A	B	C	D	L	Weight, spigot	Weight, tapped
Inches	Inches	Inches	Inches	Inches	Inches	Pounds	Pounds
2 by 4 by 24.....	8 1/2	4	4 1/2	24	19	19	19
2 by 4 by 30.....	8 1/2	4	4 1/2	30	23	23	23
2 by 4 by 36.....	8 1/2	4	4 1/2	36	27	27	29
2 by 4 by 48.....	8 1/2	4	4 1/2	48	39	39	40
3 by 4 by 24.....	8 1/2	4	4 1/2	24	20	20	20
3 by 4 by 30.....	8 1/2	4	4 1/2	30	23	23	26
3 by 4 by 36.....	8 1/2	4	4 1/2	36	31	31	31
3 by 4 by 48.....	8 1/2	4	4 1/2	48	41	42	42
4 by 5 by 24.....	8 1/2	4	4 1/2	24	25	25	26
4 by 5 by 30.....	8 1/2	4	4 1/2	30	31	31	33
4 by 5 by 36.....	8 1/2	4	4 1/2	36	38	38	39
4 by 5 by 48.....	8 1/2	4	4 1/2	48	51	52	52
4 by 6 by 24.....	8 1/2	4	4 1/2	24	61	62	62
4 by 6 by 30.....	8 1/2	4	4 1/2	30	36	36	38
4 by 6 by 36.....	8 1/2	4	4 1/2	36	44	44	45
4 by 6 by 48.....	8 1/2	4	4 1/2	48	59	61	61

¹ All markings shall be on small end and in space indicated by dimension C.

NOTE 1.—For spigot details, see table II. For tapping boss details, see table XI.

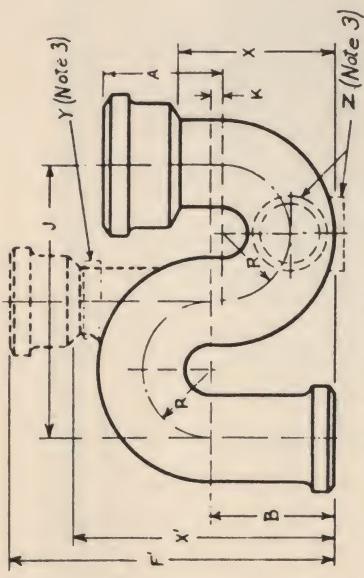


FIGURE 21.—S traps with or without vent and cleanout.

TABLE XXXIII.—S traps with or without vent and cleanout (fig. 21)

Size (inches)	Dimensions in inches ¹						Weight without hub vent (pounds)			
	A	B	F'	J	K	R				
2 by 2...	3	3 $\frac{1}{4}$	10	8	2 $\frac{1}{4}$	4	9	12	6	1 $\frac{1}{2}$
3 by 2...	4 $\frac{1}{4}$	12	10	10	5 $\frac{1}{4}$	9 $\frac{1}{4}$	20	23	5 $\frac{1}{4}$	2 $\frac{1}{2}$
3 by 3...	4 $\frac{1}{2}$	12 $\frac{1}{4}$	10	10	2 $\frac{1}{4}$	9 $\frac{1}{4}$	20	24	5 $\frac{1}{4}$	2 $\frac{1}{2}$
4 by 2...	5 $\frac{1}{4}$	14	12	12	3	11 $\frac{1}{4}$	30	33	9 $\frac{1}{4}$	3
4 by 3...	5 $\frac{1}{2}$	14	12	12	3	11 $\frac{1}{4}$	30	34	5 $\frac{1}{4}$	3
4 by 4...	5 $\frac{1}{2}$	14	12	12	3	11 $\frac{1}{4}$	30	36	6 $\frac{1}{4}$	3
5 by 4...	5 $\frac{1}{2}$	14 $\frac{1}{2}$	12	12	3 $\frac{1}{2}$	12 $\frac{1}{2}$	41	47	6 $\frac{1}{4}$	3 $\frac{1}{2}$
5 by 5...	6 $\frac{1}{2}$	16 $\frac{1}{2}$	14	14	3 $\frac{1}{2}$	13 $\frac{1}{2}$	41	48	6 $\frac{1}{4}$	3 $\frac{1}{2}$
6 by 4...	6 $\frac{1}{2}$	16 $\frac{1}{2}$	14	14	3 $\frac{1}{2}$	13 $\frac{1}{2}$	54	62	7 $\frac{1}{2}$	4
6 by 6...	7 $\frac{1}{2}$	18 $\frac{1}{2}$	16	16	3 $\frac{1}{2}$	15 $\frac{1}{2}$	54	63	7 $\frac{1}{2}$	4

¹ For details of hubs and spigots, see table II.

Note 1.—A minimum water seal of 2 inches is provided for the 2-inch size, and of 2 $\frac{1}{2}$ inches for sizes 3 to 6 inches, inclusive.

Note 2.—Dimensions J, X, and X' are laying lengths.

Note 3.—Traps with tapped vent and cleanout shall have tappings of sizes indicated below. For details of tapping bosses, see table XL. For screw plugs, see table XXVII.

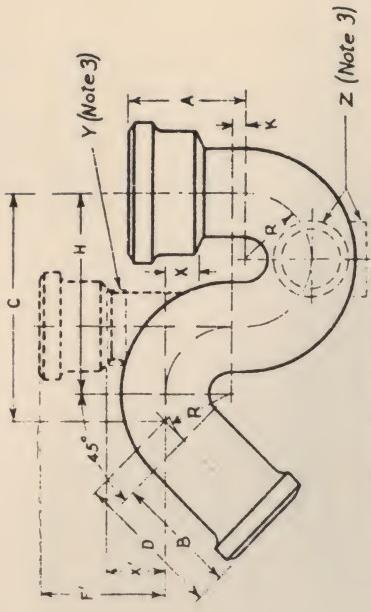


FIGURE 22.—3/4 S trap with or without vent and cleanout

TABLE XXXIV.—3/4 S traps with or without vent and cleanout (fig. 22)

Size (inches)	Dimensions in inches ¹						Dimensions in inches ¹				Weight without hub vent (pounds)	Weight with hub vent (pounds)
	A	B	C	D	F'	H	X	X'	R			
2 by 2...	3	3 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{2}$	3 $\frac{1}{4}$	4 $\frac{1}{2}$	6	6	1 $\frac{1}{2}$	2	8	11
3 by 2...	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	18	21
3 by 3...	4 $\frac{1}{2}$	5 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	18	22
4 by 2...	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	3	1	27	30
4 by 3...	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	3	1	27	31
4 by 4...	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	10 $\frac{1}{2}$	10 $\frac{1}{2}$	3	1	33	36
5 by 4...	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	11 $\frac{1}{2}$	11 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{2}$	37	43
5 by 5...	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	11 $\frac{1}{2}$	11 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{2}$	37	44
6 by 4...	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$	12 $\frac{1}{2}$	12 $\frac{1}{2}$	4	4	49	55
6 by 6...	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$	12 $\frac{1}{2}$	12 $\frac{1}{2}$	4	4	49	58

¹ For details of hubs and spigots, see table II.

Note 1.—A minimum water seal of 2 inches is provided for the 2-inch size, and of 2 $\frac{1}{2}$ inches for sizes 3 to 6 inches, inclusive.

Note 2.—Dimensions C, D, X, and X' are laying lengths.

Note 3.—For traps with tapping at Y and Z, see table XXXIII, note 3 [page 27].

Size (inches)	I.P.S. tapping at Y	I.P.S. tapping at Z	Size (inches)	I.P.S. tapping at Y		I.P.S. tapping at Z
				Inches	Feet	
2	1 $\frac{1}{2}$	1 $\frac{1}{2}$	5	5	—	3
3	2 $\frac{1}{2}$	2 $\frac{1}{2}$	6	—	—	3
4	3 $\frac{1}{2}$	3 $\frac{1}{2}$	—	—	—	—

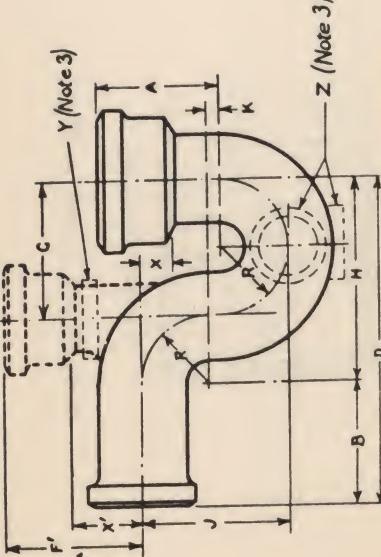


TABLE XXXV.— $\frac{1}{2}$ S traps with or without vent and cleanout (fig. 23)

Size (inches)	Dimensions in inches ¹									Weight without hub vent (pounds)	Weight with hub vent (pounds)
	A	B	C	D	F	H	J	K	R		
2 by 2	3	3½	4	9½	4½	6	—	—	2	11	8
3 by 2	4½	4½	5	12	5½	7½	—	—	14	20	21
3 by 3	5½	5½	5	12	5½	7½	—	—	14	21	22
4 by 2	5½	5½	6	14	5½	9	6½	3	25	28	27
4 by 3	5½	5½	6	14	5½	9	6½	3	25	29	31
4 by 4	6½	6½	6	14	6	9	6½	3	25	31	32
5 by 4	6½	6½	7	15½	6½	10½	7½	3½	34	40	40
5 by 5	6½	6½	7	15½	7½	10½	7½	3½	34	41	41
6 by 5	7½	7½	8	17	7½	12	8½	4	45	54	54
6 by 6	7½	7½	8	17	7½	12	8½	4	45	54	54
8 by 4	10	7½	7	10	22	8½	11	5	97	103	103
8 by 6	10	7	10	22	8½	11	11	5	97	107	107
10 by 6	12	7	12	25	9½	18	11	1	168	175	175
12 by 6	13½	8	15	30½	10½	22½	15	—	242	251	251
12 by 8	13½	8	15	30½	10½	22½	15	—	242	251	251
15 by 8	16½	8	18½	35½	12½	27½	18½	—	398	425	425

¹ For details of hubs and spigots, see table II.

NOTE 1.—A minimum water seal of 2 inches is provided for the 2-inch size; of 2½ inches for sizes 3 to 6 inches, inclusive; of 3 inches for sizes 8 to 12 inches, inclusive; and of 3½ inches for the 15-inch size.

NOTE 2.—Dimensions D, X, and X' are laying lengths. Dimension X is measured below the horizontal center line on sizes 5 by 3 inches and smaller, and above the horizontal center line on sizes 8 by 4 inches and larger. NOTE 3.—Traps with tapped vent and cleanout shall have tappings of sizes indicated below. For details of tapping bosses, see table XXVII. For screw plates, see table X.L.

Size (inches)	I. P. S. tapping at Y	I. P. S. tapping at Z	I. P. S. tapping at Y	I. P. S. tapping at Z
Inches	Inches	Inches	Inches	Inches
2	1½	1½	—	—
3	2½	2½	—	—
4	3½	3½	—	—
5	4	4	—	—
6	—	—	—	—

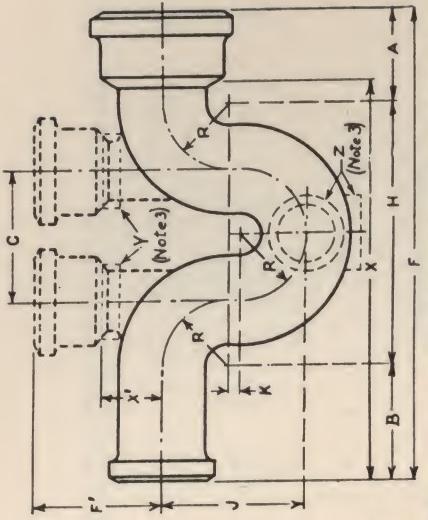


FIGURE 24-14 S traps with or without single or double vents and cleanout (fig. 23)

TABLE XXXVI.—Running traps with or without single or double vents and cleanout. (Fig. 24) and cleanout. (Fig. 24)

Size (inches)	Dimensions in inches ¹									Weight ² (pounds)
	A	B	C	F	F'	H	J	K	R	
2 by 2	3	3½	4	9½	4½	6	—	—	2	11
3 by 2	4½	4½	5	12	5½	7½	—	—	14	20
3 by 3	5½	5½	5	12	5½	7½	—	—	14	21
4 by 2	5½	5½	6	14	5½	9	6½	3	25	28
4 by 3	5½	5½	6	14	5½	9	6½	3	25	29
4 by 4	6½	6½	6	14	6	9	6½	3	25	31
5 by 4	6½	6½	7	15½	6½	10½	7½	3½	34	40
5 by 5	6½	6½	7	15½	7½	10½	7½	3½	34	40
6 by 5	7½	7½	8	17	7½	12	8½	4	45	54
6 by 6	7½	7½	8	17	7½	12	8½	4	45	54
8 by 4	10	7	10	22	8½	11	5	97	107	107
8 by 6	10	7	10	22	8½	11	11	5	97	107
10 by 6	12	7	12	25	9½	18	11	1	168	175
12 by 6	13½	8	15	30½	10½	22½	15	—	242	251
12 by 8	13½	8	15	30½	10½	22½	15	—	242	251
15 by 8	16½	8	18½	35½	12½	27½	18½	—	398	425

¹ For details of hubs and spigots, see table II.
² Weights are given as follows: W₁, without hub vent; W₂, with single hub vent; W₃, with double hub vent.

NOTE 1.—A minimum water seal of 2 inches is provided for the 2-inch size; of 2½ inches for sizes 3 to 6 inches, inclusive; of 3 inches for sizes 8 to 12 inches, inclusive; and of 3½ inches for the 15-inch size.

NOTE 2.—Dimensions X and X' are laying lengths.

NOTE 3.—For traps with tapping at Y and Z, see table XXXV, note 3.

TABLE XXXVIII.—Plugs for hub (fig. 26)

Size (inches)	P	Weight	Size (inches)		F	Weight
			Inches	(Pounds)		
2	3½	1½			4½	15
3	3½	3			4½	23
4	4	4½			5½	33
5	4	6			6½	60
6	4	8				

FIGURE 25.—Screw plugs, I. P. S. (brass.)

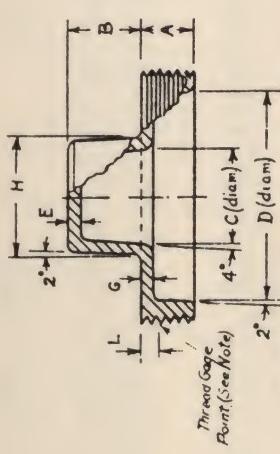
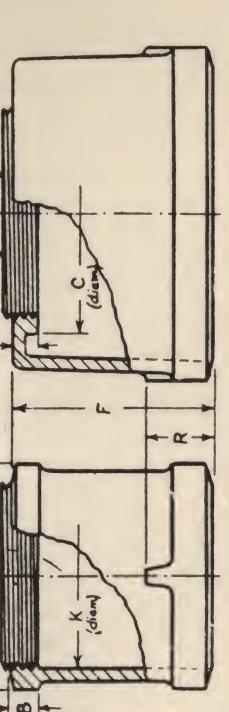


TABLE XXXVII.—Screw plugs, I. P. S. (brass) (fig. 25)

Iron pipe size (inches)	Dimensions in inches						Weight (pounds)
	A	B	C	D	E	G	
1 1/4	1 1/2	1 1/2	3/4	1 1/2	1 1/2	1 1/2	1 1/2
1 1/2	1 1/2	1 1/2	3/4	1 1/2	1 1/2	1 1/2	2 1/2
2	2	2	1	2	2	1 1/2	4
2 1/2	2 1/2	2 1/2	1 1/2	2 1/2	2 1/2	1 1/2	8
3	3	3	1	3 1/2	3 1/2	1 1/2	1 1/2
3 1/2	3 1/2	3 1/2	1	3 1/2	3 1/2	1 1/2	1 1/2
4	4	4	1	3 1/2	3 1/2	1 1/2	2
4 1/2	4 1/2	4 1/2	1	3 1/2	3 1/2	1 1/2	2 1/2
5	5	5	1	3 1/2	3 1/2	1 1/2	4
6	6	6	1	3 1/2	3 1/2	1 1/2	8

FIGURE 26.—Plug for hub.

TABLE XXXVIII.—Plugs for hub (fig. 26)



Sizes 6-inch and smaller.

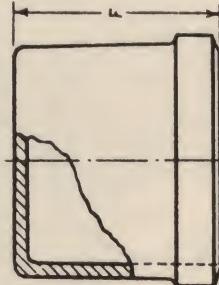
Sizes 8-inch and larger.

FIGURE 27.—Iron body ferrules with brass screw plug.

TABLE XXXIX.—Iron body ferrules with brass screw plug (fig. 27)

Size (inches)	Dimensions in inches						Weight without plugs (pounds)
	A	B	C	F	I. P. S. tapping	Depth of tapping G	
2	2 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
3	3 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	2 1/2
4	4 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	4
5	5 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	5
6	6 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	6
8	8 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	12
10	10 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	20
12	12 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	28
16	16 1/4	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	43

Note 1.—Tappings for sizes 2 inch to 6 inch, inclusive, allow entrance of testing plugs.
Note 2.—For screw plugs, see table XXXVII.



APPLIES TO CLASS A ONLY

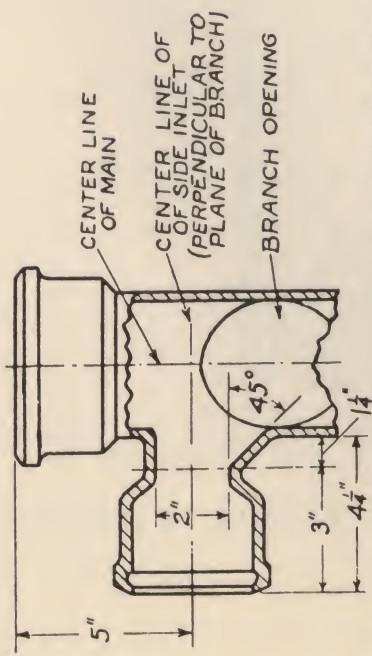


FIGURE 28.—Dimensions and location of 2-inch side inlet for single or double sanitary T branches and Y branches.

Note.—Single and double sanitary T branches and single and double Y branches with 2-inch side inlets are standard; following sizes only: 4 by 3 by 2-inch; 4 by 4 by 2-inch; 5 by 4 by 2-inch; 6 by 4 by 2-inch.

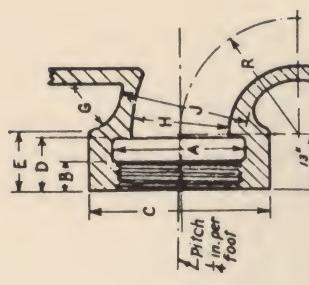


FIGURE 30.—Details of tapping bosses, $1\frac{1}{4}$ to 2 inch, I.P.S., for fittings in table XVIII (fig. 11).

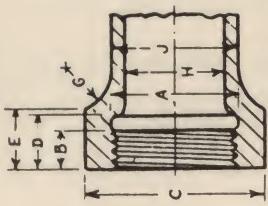


FIGURE 31.—Details of tapping bosses, $1\frac{1}{4}$ to 4 inch, I.P.S., for fittings shown in tables XXXI and XXXII.

TABLE XL.—Dimensions for tapping bosses, in inches (figs. 29, 30, 31)

Iron pipe size (inches)	A	B	C	D	E	G	H	J	K	L	R
$1\frac{1}{4}$	$1\frac{1}{4}$	$2\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{4}$							
$1\frac{1}{2}$	$1\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{4}$							
2	$2\frac{1}{2}$	$2\frac{1}{2}$	$\frac{3}{4}$								
$2\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$\frac{3}{4}$								
3	$3\frac{1}{2}$	$3\frac{1}{2}$	$\frac{3}{4}$								
$3\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$\frac{3}{4}$								
4	$4\frac{1}{2}$	$4\frac{1}{2}$	$\frac{3}{4}$								
$4\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	$\frac{3}{4}$								
5	$5\frac{1}{2}$	$5\frac{1}{2}$	$\frac{3}{4}$								
$5\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$\frac{3}{4}$								

FIGURE 29.—Details of tapping bosses, $1\frac{1}{4}$ to $5\frac{1}{4}$ inch, I.P.S., for fittings in tables XI, XII, XV, XX, XXI, and XXXII to XXXVI, inclusive.

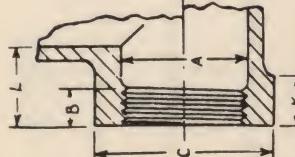


TABLE XIII.—Weights of long fittings

Kind of fitting	Length (See note)	Size of fitting (inches)													
		2	3	4	5	6	3 by 2	4 by 2	4 by 3	5 by 2	5 by 3	5 by 4	6 by 2	6 by 3	6 by 4
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Long $\frac{3}{4}$ bend (table IV)	12	8	14	19	23	28	—	—	—	—	—	—	—	—	—
	18	10	18	24	30	36	—	—	—	—	—	—	—	—	—
	24	—	—	29	36	44	—	—	—	—	—	—	—	—	—
	30	—	—	34	43	51	—	—	—	—	—	—	—	—	—
	36	—	—	39	49	58	—	—	—	—	—	—	—	—	—
Long $\frac{3}{4}$ bend (table VIII)	12	7	13	17	22	26	—	—	—	—	—	—	—	—	—
	18	9	17	23	28	34	—	—	—	—	—	—	—	—	—
	24	—	—	28	35	41	—	—	—	—	—	—	—	—	—
	30	—	—	38	47	56	—	—	—	—	—	—	—	—	—
	36	—	—	39	47	54	—	—	—	—	—	—	—	—	—
Long T branch (table XIX)	18	11	20	27	33	39	19	24	26	29	30	32	34	35	37
	24	13	24	32	39	47	23	30	31	36	37	39	42	43	44
	30	—	—	37	47	54	34	36	43	44	46	49	50	51	52
	36	—	—	43	54	62	40	42	50	51	53	57	58	59	60
Long sanitary T branch (table XVIII).	18	12	21	28	34	40	20	25	27	30	31	33	35	36	37
	24	14	25	33	40	48	24	30	32	36	37	39	43	44	45
	30	—	—	38	48	55	—	35	37	44	45	47	50	51	53
	36	—	—	44	55	63	—	41	43	51	52	54	58	60	61
Long Y branch (table XI)	18	12	22	30	37	43	20	25	27	30	32	34	34	36	38
	24	14	26	35	43	51	24	30	32	36	38	40	42	44	46
	30	—	—	40	51	58	—	35	37	44	46	48	49	51	53
	36	—	—	46	58	66	—	41	43	51	53	57	59	61	63
Long double Y branch (table XII)	18	15	28	38	46	54	24	29	33	34	38	42	43	46	49
	24	17	32	43	52	62	28	34	38	40	44	48	49	50	54
	30	—	—	48	60	69	—	39	43	48	62	66	68	69	71
	36	—	—	54	67	77	—	45	49	55	69	63	61	65	69
Long tapped T branch (table XII)	18	10	—	—	—	—	17	22	—	—	—	32	—	—	—
	24	12	—	—	—	—	21	27	—	—	—	40	—	—	—
	30	—	—	—	—	—	18	24	—	—	—	34	—	—	—
	36	—	—	—	—	—	22	29	—	—	—	42	—	—	—
Long tapped T branch, double (table XX).	18	—	—	—	—	—	18	23	—	—	—	33	—	—	—
	24	—	—	—	—	—	22	28	—	—	—	34	—	—	—
	30	—	—	—	—	—	22	28	—	—	—	34	—	—	—
	36	—	—	—	—	—	20	25	—	—	—	30	—	—	—
Long tapped T branch, double (table XVIII)	18	12	—	—	—	—	12	17	—	—	—	25	—	—	—
	24	15	—	—	—	—	15	21	—	—	—	30	—	—	—
	30	—	—	—	—	—	15	20	—	—	—	36	—	—	—
	36	—	—	—	—	—	15	20	—	—	—	36	—	—	—

¹ Tapped 1 $\frac{1}{4}$, 1 $\frac{1}{2}$, and 2 inch, I. P. 8.

Note.—The length of bonds is measured from end of spigot to intersection of hub and spigot center lines (D on fig. 2). The length of T and Y branches is measured as the laying length (X on fig. 6).

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